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NATIONAL DAM SAFETY PROGRAM. YOUNGS POND DAM (NJ00270) DELAWARE--ETC(U)
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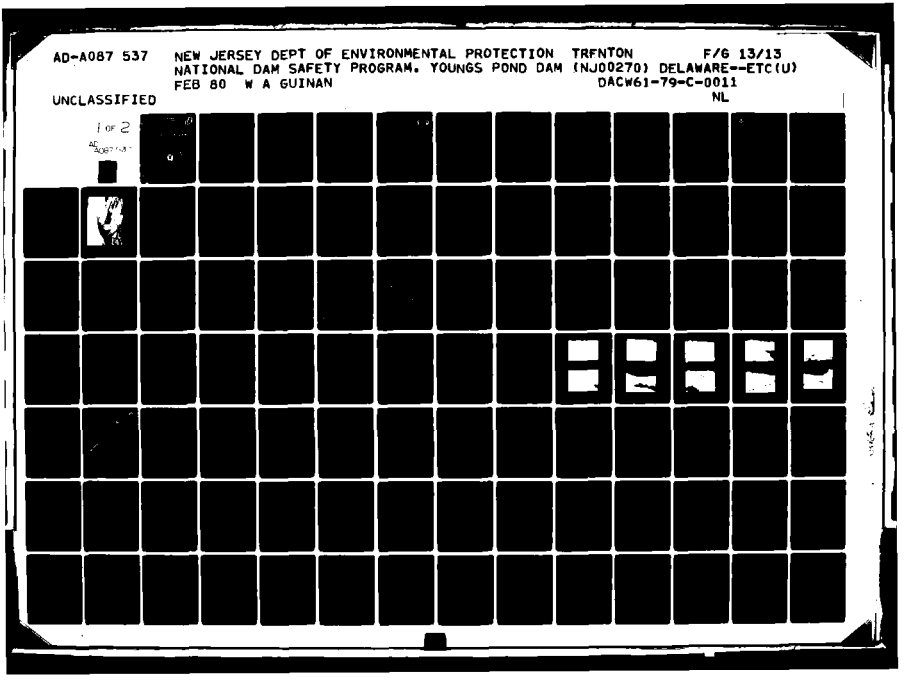

LEVEL II

DELAWARE RIVER BASIN
JACKSONBURG CREEK,
WARREN COUNTY
NEW JERSEY

YOUNGS POND DAM
NJ 00270

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

DEPARTMENT OF THE ARMY
Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

FEBRUARY 1980

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: NJ00270	2. GOVT ACCESSION NO.: ADA087537
3. RECIPIENT'S CATALOG NUMBER:	
4. TITLE (and Subtitle): Phase I Inspection Report National Dam Safety Program; Youngs Pond Dam (NJ00270) Delaware River Basin, Warren County, New Jersey	5. TYPE OF REPORT & PERIOD COVERED: FINAL Sept 79
6. PERFORMING ORG. REPORT NUMBER:	
7. AUTHOR(s): Phase I Inspection Report; WARREN A. GUINAN	8. CONTRACT OR GRANT NUMBER(s): DACW61-79-C-0011
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Anderson-Nichols, 6 London Rd., Concord, N.H. 03301	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS:
11. CONTROLLING OFFICE NAME AND ADDRESS: NJ Department of Environmental Protection, Division of Water Resources, P.O. Box CN029, Trenton, NJ 08625	12. REPORT DATE: Feb 1980
	13. NUMBER OF PAGES: 101
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): U.S. Army Engineer District, Philadelphia, Custom House, 2d & Chestnut Streets, Philadelphia, PA 19106	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

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DDC TAB
Unannounced
Justification
By
Distribution/
Availability Codes
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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia 22151.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams
Embankments
Structural Analysis
Visual Inspection
National Dam Safety Program
Youngs Pond Dam, New Jersey
Seepage
Erosion

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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410891

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-N

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

29 JUL 1980

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Youngs Pond Dam in Warren County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Youngs Pond Dam, a high hazard potential structure, is judged to be in fair overall condition. The spillway is considered seriously inadequate because a flow equivalent to nine percent of the Probable Maximum Flood (PMF) would cause the dam to be overtopped. The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard of loss of life downstream from the dam. To ensure adequacy of the structure, the following actions, as a minimum, are recommended.

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures, and studies within six months from the date of approval of this report. Within three months of the consultant's findings, remedial measures to ensure spillway adequacy should be initiated. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. Within six months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Investigate the seepage and standing water near the toe of the dam and design remedial measures, if needed.

(2) Design or specify repairs for the erosion on the upstream and downstream slopes of the dam.

(3) Design control valves to be installed at the upstream end of the low-level outlet pipes to replace the existing valves near the downstream end of the pipes.

(4) Design or specify and inspect the installation of suitable erosion protection for the emergency spillway channel and the exposed banking south of the emergency spillway.

(5) Evaluate the erosion resistance of the emergency spillway channel and design remedial measures, if needed.

c. The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

d. Within thirty days from the date of approval of this report, a program should be initiated to check the condition of the dam periodically and monitor the seepage near the downstream toe until remedial measures are effected.

e. The following actions should be completed within six months from the date of approval of this report:

(1) Cut trees on the embankment.

(2) Mow weeds and brush on the embankment.

(3) Clear trees and brush from the end of the emergency spillway down to the main stream channel.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Courter of the Thirteenth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

NAPEN-N
Honorable Brendan T. Byrne

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Safety Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,

1 Incl
As stated

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

Copies furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Management
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

YOUNGS POND DAM (NJ00270)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 6 November 1979 by Anderson-Nichols and Company, Inc. under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Youngs Pond Dam, a high hazard potential structure, is judged to be in fair overall condition. The spillway is considered seriously inadequate because a flow equivalent to nine percent of the Probable Maximum Flood (PMF) would cause the dam to be overtopped. The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard of loss of life downstream from the dam. To ensure adequacy of the structure, the following actions, as a minimum, are recommended.

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures, and studies within six months from the date of approval of this report. Within three months of the consultant's findings, remedial measures to ensure spillway adequacy should be initiated. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. Within six months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Investigate the seepage and standing water near the toe of the dam and design remedial measures, if needed.

(2) Design or specify repairs for the erosion on the upstream and downstream slopes of the dam.

(3) Design control valves to be installed at the upstream end of the low-level outlet pipes to replace the existing valves near the downstream end of the pipes.

(4) Design or specify and inspect the installation of suitable erosion protection for the emergency spillway channel and the exposed banking south of the emergency spillway.

(5) Evaluate the erosion resistance of the emergency spillway channel and design remedial measures, if needed.

c. The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

d. Within thirty days from the date of approval of this report, a program should be initiated to check the condition of the dam periodically and monitor the seepage near the downstream toe until remedial measures are effected.

e. The following actions should be completed within six months from the date of approval of this report:

(1) Cut trees on the embankment.

(2) Mow weeds and brush on the embankment.

(3) Clear trees and brush from the end of the emergency spillway down to the main stream channel.

APPROVED: James G. Ton

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 11 JULY 1980

UNSAFE DAM
NATIONAL PROGRAM OF INSPECTION OF DAMS

a. NAME: Youngs Pond Dam

b. ID NO.: NJ00270

c. LOCATION State: New Jersey, County: Warren.
River or Stream: Jacksonburg Creek.
Nearest D/S City or Town: Jacksonburg.

d. HEIGHT: 18 feet

e. MAXIMUM IMPOUNDMENT CAPACITY: 391 ac. ft.

f. TYPE: Earthfill.

g. OWNER: Kenneth W. Young.

h. DATE GOVERNOR NOTIFIED OF UNSAFE CONDITIONS: 19 June 1980

i. CONDITION OF DAM RESULTING IN UNSAFE ASSESSMENT: Preliminary report calculations indicate nine percent of the PMF would overtop the dam.

l. URGENCY CATEGORY: High Hazard, UNSAFE, Non-Emergency.

m. EMERGENCY ACTIONS TAKEN:
Gov. notified of this condition by District Engineer's letter of 19 June 1980

j. DESCRIPTION OF DANGER INVOLVED: High Hazard potential, overtopping and failure of the dam would significantly increase hazard potential to loss of life and property downstream of dam.

n. REMEDIAL ACTIONS TAKEN:
N.J.D.E.P. will notify dam's owner upon receipt of our letter.

k. RECOMMENDATIONS GIVEN TO GOVERNOR:
Within 30 days of the date of the District Engineer's letter the owner should do the following:
a. Engage the services of a qualified professional consultant to more accurately determine the spillway adequacy by using more detailed and sophisticated hydrologic and hydraulic analyses, and to recommend any remedial measures required to prevent overtopping of the dam.
b. In the interim, a detailed emergency operation plan and downstream warning system should be developed. Also, around-the-clock surveillance should be provided during periods of unusually heavy precipitation.

o. REMARKS: Final report, to be issued within six weeks, will have WHITE cover.

T.B. HEVERIN, Coordinator
Dam Inspection Program
U.S.A.E.D., Philadelphia

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-N

19 JUN 1980

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, NJ 08621

Dear Governor Byrne:

This is in reference to our ongoing National Program for Inspection of Non-Federal Dams within the State of New Jersey. Youngs Pond Dam (Federal I.D. No. NJ00270), a high hazard potential structure has recently been inspected. The dam is owned by Kenneth W. Young and is located on Jacksonburg Creek in Jacksonburg.

Using Corps of Engineers screening criteria, it has been determined that the dam's two spillways are seriously inadequate because a flow equivalent to seven percent of the Probable Maximum Flood would cause the dam to be overtopped. The seriously inadequate spillways are assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise, or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard potential to loss of life downstream from the dam. As a result of this UNSAFE determination, it is recommended that the dam's owner take the following measures within 30 days of the date of this letter:

a. Engage the services of a qualified professional consultant to more accurately determine the spillway adequacy by using more detailed and sophisticated hydrologic and hydraulic analyses, and to recommend any remedial measures required to prevent overtopping of the dam.

b. In the interim, a detailed emergency operation plan and downstream warning system should be promptly developed. Also, around the clock surveillance should be provided during periods of unusually heavy precipitation.

A final report on this Phase I Inspection will be forwarded to you within two months.

Sincerely,

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

Copies Furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Youngs Pond Dam
Identification No.:	FED ID No. NJ00270
State Located:	New Jersey
County:	Warren
Stream:	Jacksonburg Creek
River Basin:	Delaware
Date of Inspection:	6 November 1979

ASSESSMENT OF GENERAL CONDITIONS

Youngs Pond Dam is 8 years old and in fair overall condition. It is small in size and is classified as high hazard. An area of seepage and standing water near the toe of the dam was observed. Erosion areas occur on the upstream and downstream slopes of the dam. Erosion was further noted on the slopes adjacent to the emergency spillway. Youngs Pond Dam has two spillways. Together they can pass less than 8 percent of the PMF which is approximately 16 percent of the selected half-PMF test flood, and are seriously inadequate.

It is recommended that the owner retain the services of a professional engineer, qualified in the design and inspection of dams, to accomplish the following in the near future: investigate the seepage and standing water near the toe of the dam and design remedial measures, if needed; design and specify repairs for erosion on the upstream and downstream slopes of the dam; design control valves to be installed at the upstream end of the low-level outlet pipes to replace the existing valves near the downstream end of the pipes; design and specify repairs for erosion on the slopes adjacent to the emergency spillway; evaluate the erosion resistance of the emergency spillway channel and design remedial measures, if needed; conduct additional hydrologic and hydraulic analyses of the watershed, reservoir, dam and spillways to determine the need, type and extent of mitigating measures required. It is further recommended that starting immediately, the owner begin a program of checking the condition of the dam on a regular basis and monitoring the seepage near the downstream toe of the dam. In addition, in the future the owner should: cut trees on the embankment; mow weeds and brush on the embankment; clear trees and brush from the end of the emergency spillway down to the main stream channel; establish a surveillance program for use during and after periods of heavy rainfall and establish a warning program to follow in case of emergency conditions. Within one year from the date of approval of this report, the owner should develop written operating procedures and a periodic maintenance plan to insure the safety of the dam.

ANDERSON-NICHOLS & COMPANY, INC.

Warren A. Guinan

Warren A. Guinan, P.E.
Project Manager
New Jersey No. 16848

6 NOVEMBER 1979

OVERVIEW
YOUNGS POND DAM

CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY REPORT

YOUNGS POND DAM NJ NO. 615 FED ID NO. NJ00270

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY INSPECTION PROGRAM
YOUNGS POND DAM
FED ID NO. NJ00270 - NJ NO. 615

1.1 General

a. Authority. Authority to perform the Phase I Safety Inspection of Youngs Pond Dam was received from the State of New Jersey, Department of Environmental Protection, Division of Water Resources by a letter dated 26 October 1979, under Contract FPM No. 39 dated 28 June 1978. This authority was given pursuant to the National Dam Inspection Act, Public Law 92-367 and by agreement between the State and U.S. Army Engineers District, Philadelphia. The inspection discussed herein was performed by Anderson-Nichols & Company, Inc. on 6 November 1979.

b. Purpose. The purpose of the Phase I Investigation is to develop an assessment of the general conditions with respect to the safety of Youngs Pond Dam and appurtenances based upon available data and visual inspection and determine any need for emergency measures and conclude if additional studies, investigations and analyses are necessary and warranted.

1.2 Project Description

a. Description of Dam and Appurtenances. Youngs Pond Dam is an 18 foot high, 460 foot long earth embankment dam built in 1972. The downstream face of the dam is earth with 2H:IV slope. The principal spillway is a drop spillway and is 50 feet from the south abutment and 8 feet from the upstream face of the dam. The emergency spillway is adjacent to the south abutment. The principal spillway is 62 feet around and is a rectangular free overflow flat crested drop spillway. Discharge drops over the spillway and into an 8 foot wide by 7 foot high by 107 foot long concrete box culvert which passes under the dam embankment. The emergency spillway is an unpaved excavated channel with a 20 foot bottom width and 1H:1V side slopes. The emergency spillway measures 410 feet from the upstream face of the dam to where it joins the spillway discharge channel downstream. Two 12-inch diameter cast iron low level outlet pipes pass through the dam 250 feet from the north abutment. Access to the low level outlet gate mechanism is through a manhole 60 feet downstream of the dam crest at the toe of the dam. Essential features of the dam are given in Figure 1 and Figure 2 and shown in the design plans in Appendix 4.

b. Location. The dam is located in Warren County, New Jersey on Jacksonburg Creek, a tributary to Paulins Kill in Jacksonburg. It is at north latitude 41°01.3' and west longitude 74°59.0'. A location map is given in Figure 3.

c. Size Classification. Youngs Pond Dam is classified as being "small" in size in accordance with criteria given in the Recommended Guidelines for Safety Inspection of Dams on the basis of storage at the dam crest of 492 acre feet, which is less than 1000 acre feet, but more than 50 acre feet, and on a height of 18 feet, which is less than 40 feet.

d. Hazard Classification. Visual inspection of the downstream area and the breach analysis contained herein show that a breach of Youngs Pond Dam could cause excessive damage to 3 residences located downstream of the dam and the potential exists for loss of 10 or more lives. Accordingly, Youngs Pond Dam is classified as High Hazard.

e. Ownership. The dam is owned by Kenneth W. Young, 18 Young Avenue, Cedar Grove, New Jersey 07009.

f. Purpose of Dam. Youngs Pond Dam was designed and constructed and currently is used for recreation and the preservation and propagation of fish life.

g. Design and Construction History. The dam was designed and built by Morris Engineers Inc., P.O. Box 289, Ledgewood, New Jersey 07852 in 1972. A set of plans consisting of 10 sheets was recovered from NJDEP files. Applications and pertinent plan sheets are included in Appendix 4. The design plans show fill was added to an "existing grade" indicating a dam was in place at the time of the Morris design drawings. Additionally on the "Report for Dam Application" dated 29 June 1972 an earthfill dam was indicated as existing. No additional information relating to the existing dam was revealed either in NJDEP files or communication with the present dam owner. Applications and pertinent plan sheets are included in Appendix 4. The plans were approved by the New Jersey Department of Environmental Protection, Division of Water Resources, Bureau of Water Control on 30 June 1972.

h. Normal Operational Procedures. The owner of the dam, Mr. Kenneth W. Young indicated that the low level outlet has been operated at irregular intervals. No formal written operating procedures were disclosed.

i. Site Geology. Limited boring data indicated that the dam is founded on "gray decomposed shale." Information derived from a Geologic Map of New Jersey (Lewis and Kummel, 1912) indicates that soils within the immediate site area consist of ground moraine overlying bedrock.

The map indicates that the underlying bedrock consists of black slatey shale with thin interbeds of sandstone, which are Ordovician in age.

1.3 Pertinent Data

a. Drainage Area

4.5 square miles

b. Discharge at Damsite (cfs)

Maximum flood at damsite - unknown

Low-level outlet at pool elevation (at spillway crest) - 18

Principal spillway (at top of dam) - 1025

Emergency spillway (at top of dam) - 125

Total spillway capacity (at top of dam) - 1150

c. Elevation (feet above NGVD)

Top of dam - 707.3

Maximum pool - (½ PMF) - 710.4

Principal spillway crest (normal pool) - 698.2

Emergency spillway crest - 706.0

Downstream invert low-level outlet - 680.2

Streambed at centerline of dam - 684.2

Maximum tailwater (estimated) - 688.4

d. Reservoir

Length of maximum pool (estimated) - 1800 feet

Length of normal pool - 1100 feet

e. Storage (acre-feet)

Principal spillway crest (normal pool) - 172

Top of dam - 332

Maximum pool (½ PMF) - 391

f. Reservoir (acres)

Top of dam - 28

Spillway crest - 14

g. Dam

Type - earth embankment with earth facing

Length - 460 feet

Height (structural) - 18 feet

(hydraulic) - 12 feet

Topwidth - 15 feet

Side slopes (upstream) - 3H:1V

(downstream) 2H:1V

Zoning - "compacted fill in 6 inch layers" (from design plans)

Impervious core - no impervious core shown on design plans

Cutoff - no cutoff shown on design plans

Grout curtain - no grout curtain shown on design plans

h. Spillways

Principal spillway

Type - free overflow, flat crested, rectangular, drop spillway

Length - 62 feet

Crest Elevation - 698.2 NGVD

Gates - none

Emergency spillway

Type - free overflow exposed shale spillway

Length - 20 feet

Crest elevation - 706.0 NGVD

Gates - none

Upstream Channel - Youngs Pond

Downstream Channel - Jacksonburg Creek

i. Regulating Outlets

2 - 12" cast iron low level outlet pipes. Valving mechanism access is through a manhole 60 feet downstream of the dam crest.

SECTION 2
ENGINEERING DATA

2.1 Design

A copy of the design plans for the spillway, dam and low-level outlet dated 4 January 1972 was received from NJDEP files. The design plans consist of ten sheets. The plans show: a key map; sheet 1: 1"=100' scale contour map of the proposed lake; sheet 2: detail sheet for the low-level outlet manhole access; sheet 3: detail sheet for the principal spillway; sheet 4: detail sheet showing the placement of the reinforcing steel and concrete for the principal spillway; sheet 4: detail sheet for the principal spillway; sheet 5: cross sections of the dam and boring logs; sheet 6: cross sections of the dam and profiles of the lake bottom; sheet 7, sheet 8 and sheet 9: profiles of the lake bottom. These plans were drawn for Mr. Kenneth W. Young by Morris Engineers Inc. and filed in accordance with NJDEP regulations concerning stream encroachment. These plans were approved by the New Jersey Department of Environmental Protection, Division of Water Resources, Bureau of Water Control on 30 June 1972.

2.2 Construction

No recorded data concerning the construction of Youngs Pond Dam was revealed. Communication with Mr. Kenneth W. Young indicates that the dam was built in 1972. Additional original construction data was not disclosed.

2.3 Operation

No engineering operational data were found.

2.4 Evaluation

a. Availability. A search of NJDEP files and contact with the owner of the dam revealed only a limited amount of recorded information in addition to the design plans.

b. Adequacy. Because of the limited amount of recorded information available the evaluation was based primarily on visual observations.

c. Validity. The validity of the information retrieved was generally substantiated by visual inspection, however several discrepancies were noted. The dam crest elevation shown on design drawing 3 is 703.61. The crest elevation measured in the field, and related to the principal spillway crest elevation shown on the drawings was 707.3. This indicates that the dam was built 3.7 feet higher than originally designed. Discrepancies found relative to hydraulic design data are discussed in section 5.1.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. Dam. Extensive seepage was observed around the perimeter of a small basin at the downstream toe of the dam between the discharge end of the low level outlet pipes and a small weir immediately downstream. Some standing water near the downstream toe of the dam close to the north abutment was noted. Numerous erosion channels exist on the upstream and downstream slopes and on the contact between the upstream slope and the south abutment. Vehicle tracks and ruts on the contact between the downstream slope and the north abutment in the area immediately downstream of the toe of the dam and on the crest of the dam were also noted. Pine trees have been planted on the downstream slope at the south end of the dam between the ungated drop spillway discharge channel and the emergency spillway. A thick growth of grass, weeds, and berry bushes on the upstream and downstream slopes makes it impossible to inspect the slopes adequately.

b. Appurtenant Structures. An emergency spillway has been excavated in the natural ground of the south abutment. A bedrock exposure in the bottom of the emergency spillway at one location was observed. No erosion protection on the north side of the emergency spillway channel exists where the end of the embankment section of the dam is exposed. Additionally, no erosion protection exists on the south abutment adjacent to the emergency spillway channel. Fallen trees and erodable soil along the bank may lead to slope instability. Several logs and some cut brush in the emergency spillway channel were also noted. Trees are growing at the downstream end of the excavated emergency spillway.

c. Reservoir Area. The watershed above the pond is moderately to steeply sloping and heavily wooded, except for a zone close to the reservoir where logging operations were underway at the time of the inspection. Slopes adjacent to the lake appeared to be stable. No evidence of significant sedimentation was observed. A settling basin has been built to collect runoff from the logging area before it discharges into the pond.

d. Downstream Channel. Some trees overhang the discharge channel downstream from the low level outlet and one tree has fallen across the channel.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedures

According to the owner no formal operating procedures are followed. Normal operating procedures are described in Section 1.2 h.

4.2 Maintenance of Dam

From the condition of the dam it is apparent that a maintenance program is followed, though no written procedures exist.

4.3 Maintenance of Operating Facilities

According to the owner no formal maintenance procedures for the low level outlet are followed. The low level outlet is operated at irregular intervals.

4.4 Warning System

No formal warning system is in effect.

4.5 Evaluation of Operational Adequacy

A regular operational and maintenance program should be established for Youngs Pond Dam. This program should include measures described in Section 7.2 and be implemented as prescribed.

SECTION 5
HYDROLOGIC/HYDRAULIC

5.1 Evaluation of Features

a. Design Data. Original hydrologic data used for the design of the drop spillway revealed that the drop spillway design is based on a 50-year discharge frequency developed from the North and Central New Jersey curves. Approval for the design criteria was given by the New Jersey Department of Environmental Protection, Department of Water Resources, Bureau of Water Control on 30 June 1972. The Report on Dam Application obtained from NJDEP files and included in Appendix 4 shows the design discharge as weir flow of 1670 cfs under a spillway head of 4.25 feet. A sheet of unknown origin attached to the application report verifies this weir computation and also shows an orifice calculation for the outlet conduit which indicates a discharge of 1100 cfs with 13.94 feet of head on the spillway conduit. Computations prepared for this inspection report indicated that the principal spillway discharge capacity will be controlled by the weir up to a head of 2.6 feet and by the capacity of the rectangular discharge conduit at greater heads. This indicates that under the design head of 4.25 feet the spillway capacity is 850 cfs not 1670 cfs or 1100 cfs. The maximum spillway capacity shown on the Report on Dam Application is 57,000 cfs. No computational backup is provided, however this figure is clearly in error. Calculations for this report show a combined principal and emergency spillway discharge at top of dam of 1150 cfs. The emergency spillway was apparently added after the dam was built.

b. Experience Data. Data recieved through conversation with Mr. Kenneth W. Young, owner, indicated that since Youngs Pond Dam was built he has never seen the dam overtopped. No written experience data were disclosed indicating an overtopping problem in the past.

c. Overtopping Potential. The hydraulic/hydrologic evaluation for Youngs Pond Dam is based on a Spillway Design Flood (SDF) equal to one-half the Probable Maximum Flood (½ PMF) in accordance with the range of test floods given in the evaluation guidelines for dams classified as high hazard and small in size. The PMF has been determined by application of the SCS Dimensionless Unit Hydrograph procedure to a 24 hour probable maximum storm of 25.4 inches. Hydrologic computations are given in Appendix 3. The routed half PMF peak discharge for the subject drainage area is 8168 cfs. The maximum elevation of the dam allows 9.1 feet of depth over the principal drop spillway and 1.3 feet of depth in the emergency spillway before embankment overtopping occurs. The low-level outlet is assumed closed. Under this head the combined spillway capacity is 1150 cfs which is less than the selected SDF.

Flood routing calculations indicate that Youngs Pond Dam will be overtopped for more than 6 hours to a maximum depth of 3.1 feet over the dam crest under ½ PMF conditions.

After passing over Youngs Pond Dam, the discharge channel, Jacksonburg Creek, continues about 1500 feet downstream and under Mohican Road. Approximately 6400 feet downstream of this road bridge is a second road crossing. About 3800 feet downstream of the second road crossing is a third road crossing, Jacksonburg Road. Three residences line the west side of Jacksonburg Creek adjacent to the third road crossing. Jacksonburg Creek is a steeply sloping and deeply channeled stream downstream of Youngs Pond Dam. These characteristics when combined with the storm that could cause the dam to overtop, pose the threat of flooding to the three residences downstream.

The overflow from the dam was routed through four cross sections representative of the stream and channel downstream. The water depth occurring at the third road crossing, Jacksonburg Road, determines the depth of inundation for the Jacksonburg Road residences. The analysis determines the depth of flooding experienced under two conditions of the dam. These conditions are that the dam is overtopped and does not fail, and that the dam is overtopped and does fail. Failure is assumed to occur when overtopping begins. The analysis indicates that under a storm representing 20 percent of the PMF, which is less than the selected test flood, overtopping and failure would significantly increase the hazard to loss of life at the damage area by causing a flood elevation 4 feet higher than that which would occur without failure of the dam. This 4 foot increase would increase the inundation at one house from 2 feet to 6 feet, at another house from 1 foot to 5 feet, and cause the flood wave to reach the first floor sill of another house which is unaffected by the non-failure discharge. Because the stream is steep, very high flow velocities would occur.

The dam is classified as high hazard and the hazard to loss of life is increased by failure of the dam due to overtopping over that which exists just prior to overtopping failure. Together the principal and emergency spillways can pass less than 8 percent of the PMF without causing the dam to overtop and are considered seriously inadequate.

e. Drawdown Capability. If the low-level outlet currently in place is fully operable, it is estimated that the pond can be entirely drained in approximately 9.3 days, assuming no significant inflow. This time period would be considered marginal for draining the reservoir in an emergency situation. However, the reservoir can be drawn down to 4 feet deep and 22 acre-feet of storage within 5 days which is considered adequate because this effectively removes the hazard associated with breaching of the dam.

SECTION 6
STRUCTURAL STABILITY

6.1 Visual Inspection. Seepage and standing water at the toe of the dam are signs of potential stability problems, the magnitude of which cannot be evaluated on the basis of the visual inspection alone. Erosion on the upstream slope, the downstream slope and the contact between the upstream slope and the south abutment, if not controlled, could cause new seepage problems to develop in the embankment. A lack of erosion protection lowers the resistance of the dam in case of overtopping, and could, if given the opportunity to continue unchecked, result in breaching of the dam. Vehicle tracks and ruts on the downstream toe area and on the contact between the downstream slope and the north abutment, lower the erosion resistance in those areas and may cause new seepage problems to develop. If the trees that have been planted on the downstream slope grow to significant size, they can cause serious seepage and erosion problems if they blow over and pull out their roots or if a tree dies or is cut and its roots rot.

6.2 Design and Construction Data. No design or construction data pertinent to the structural stability of the dam are available. The design of the dam was approved by the New Jersey Department of Environmental Protection, Division of Water Resources, Bureau of Water Control on 30 June 1972.

6.3 Operating Records. No operating records pertinent to the structural stability of the dam are available.

6.4 Post-Construction Changes. Design plans prepared by Morris Engineers, Inc. dated 4 January 1972 are available. These plans indicate that there was an existing dam at the site at that time and that additional fill was placed on the embankment and downstream toe area. Borings were taken on the upstream slope of the dam but there is no information about the character of the central part of the cross-section. The drawings show a proposed valve near the downstream end of the low-level outlet pipes. Visual inspection substantiated the information found on the drawing concerning the valve placement. This type of valve placement does not prevent reservoir water from entering the pipes should they break or develop significant leaks within the embankment.

The owner excavated an emergency spillway in the south abutment after the dam was built. Although there appears to be a bedrock exposure at one location in the bottom of the spillway, it cannot be determined on the basis of visual inspection alone whether this spillway has adequate erosion resistance. No erosion protection has been placed on the end of the embankment dam which is exposed on the north side of the spillway channel.

6.5 Seismic Stability. This dam is in Seismic Zone 1. According to the Recommended Guidelines, dams located in Seismic Zone 1 "may be assumed to present no hazard from earthquake provided static stability conditions are satisfactory and conventional safety margins exist". None of the visual observations made during the inspection are indicative of unstable slopes. However, because of the limited data available concerning the engineering properties of the embankment and foundation materials for this dam, it is not possible to make an engineering evaluation of the stability of the slopes or the factor of safety under static conditions.

SECTION 7
ASSESSMENT, RECOMMENDATIONS/REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. Youngs Pond Dam is 8 years old and is in fair overall condition.

b. Adequacy of Information. The information available is such that the assessment of this dam must be based primarily on the results of the visual inspection and inspection of dam application information.

c. Urgency. The owner should implement the recommendations made in 7.2 as prescribed.

d. Necessity for Additional Data/Evaluation. The information available from the visual inspection is adequate to identify the potential problems which are listed in 7.2 a. These problems require the attention of a professional engineer who will have to make additional engineering studies to design or specify remedial measures. If left unattended, the problems could lead to instability of the structure.

7.2 Recommendations/Remedial Measures

a. Recommendations. The owner should retain a professional engineer qualified in the design and construction of dams to accomplish the following in the near future:

(1) Investigate the seepage and standing water near the toe of the dam and design remedial measures, if needed.

(2) Design or specify repairs for the erosion on the upstream and downstream slopes of the dam.

(3) Design control valves to be installed at the upstream end of the low-level outlet pipes to replace the existing valves near the downstream end of the pipes.

(4) Design or specify and inspect the installation of suitable erosion protection for the emergency spillway channel and the exposed banking south of the emergency spillway.

(5) Evaluate the erosion resistance of the emergency spillway channel and design remedial measures, if needed.

(6) Conduct additional hydrologic and hydraulic analyses of the watershed, reservoir, dam, and spillways to determine the need, type, and extent of mitigating measures required.

b. Operating and Maintenance Procedures. The owner should do the following immediately:

(1) Start a program of checking the condition of the dam on a regular basis and monitoring the seepage near the downstream toe of the dam.

The owner should do the following in the near future:

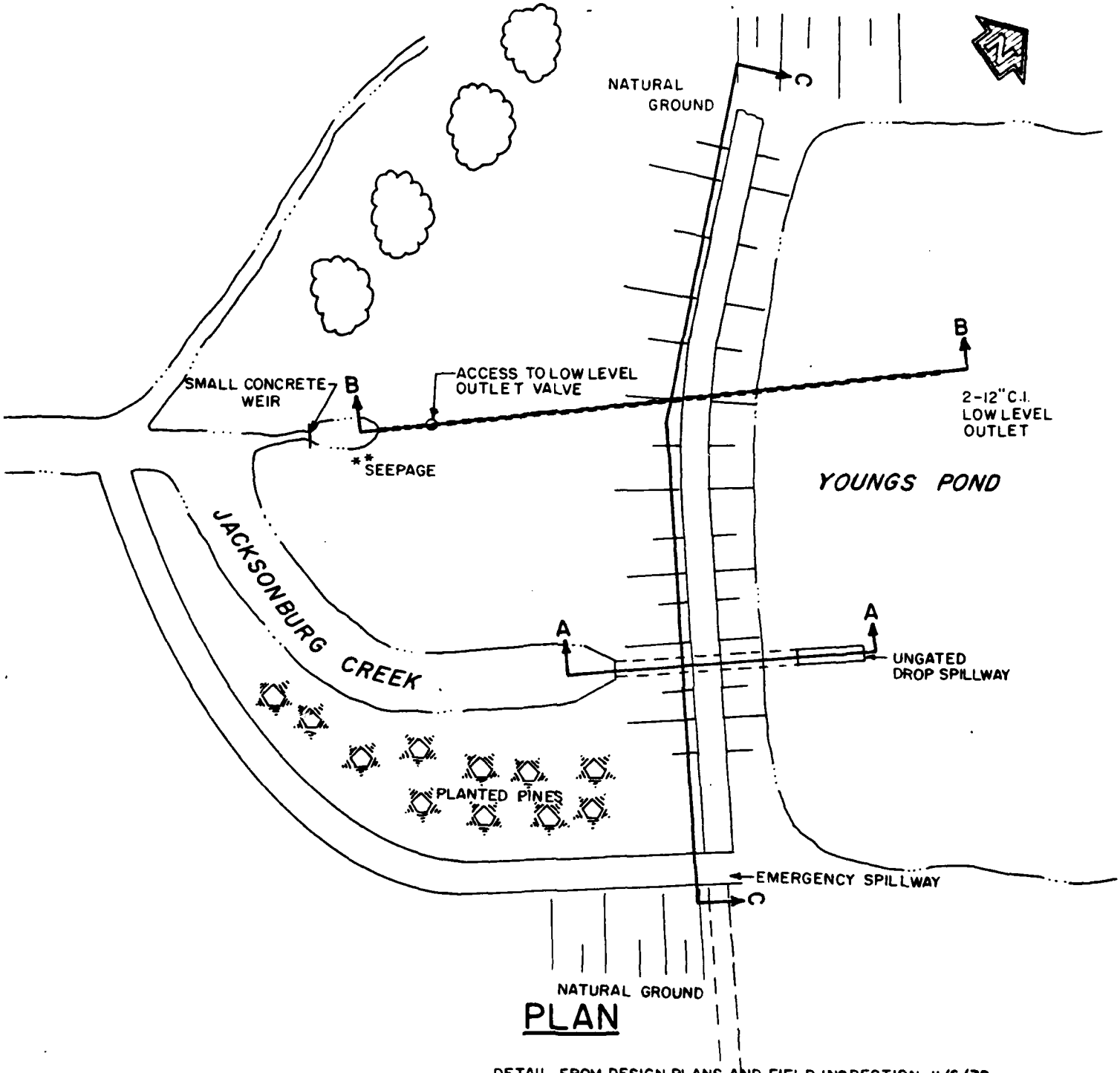
(1) Cut trees on the embankment.

(2) Mow weeds and brush on the embankment.

(3) Clear trees and brush from the end of the emergency spillway down to the main stream channel.

(4) Establish a surveillance program for use during and after periods of heavy rainfall and also a warning program to follow in case of emergency conditions.

Within one year from the date of approval of this report, the owner should develop written operating procedures and a periodic maintenance plan to insure the safety of the dam.



PLAN

DETAIL FROM DESIGN PLANS AND FIELD INSPECTION 11/6/79

Anderson-Nichols & Co, Inc. CONCORD NEW HAMPSHIRE	U.S. ARMY ENGINEER DIST PHILADELPHIA CORPS OF ENGINEERS PHILADELPHIA, PA.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

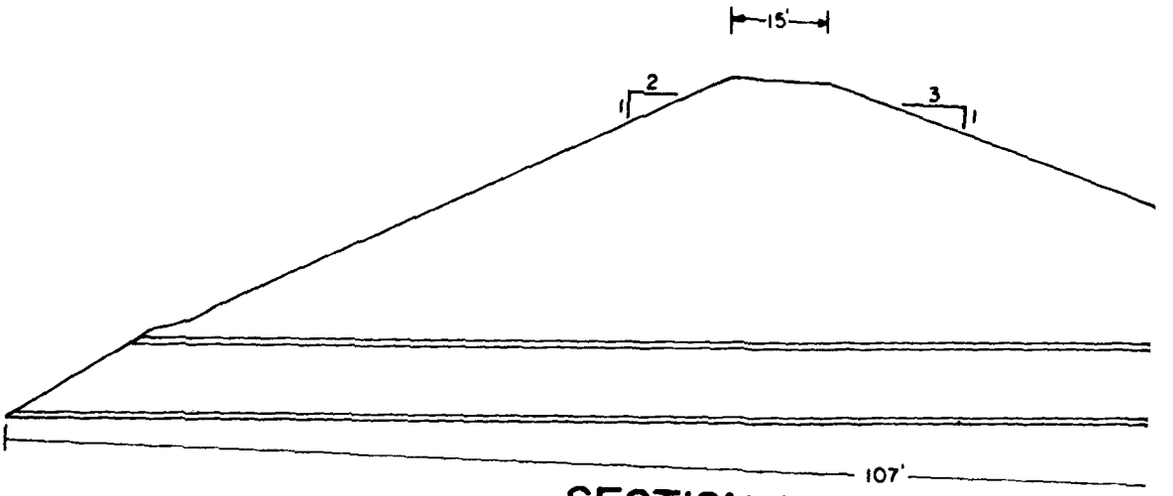
YOUNGS POND DAM

JACKSONBURG CREEK NEW JERSEY

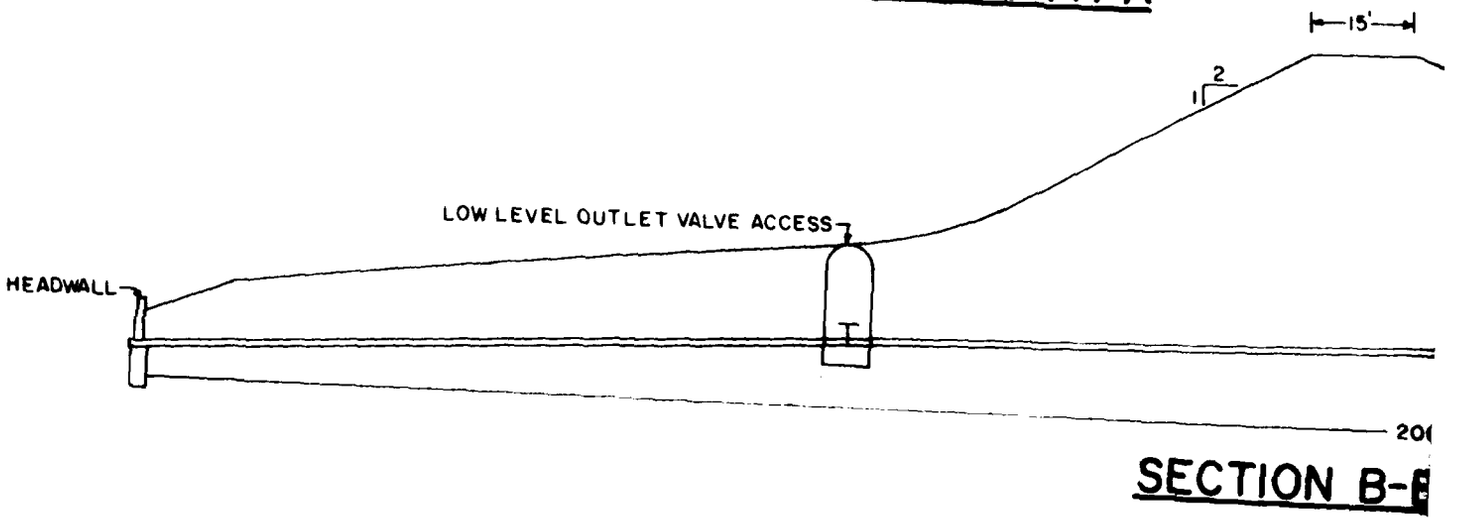
SCALE: NOT TO SCALE

DATE: JANUARY 1980

FIGURE 1

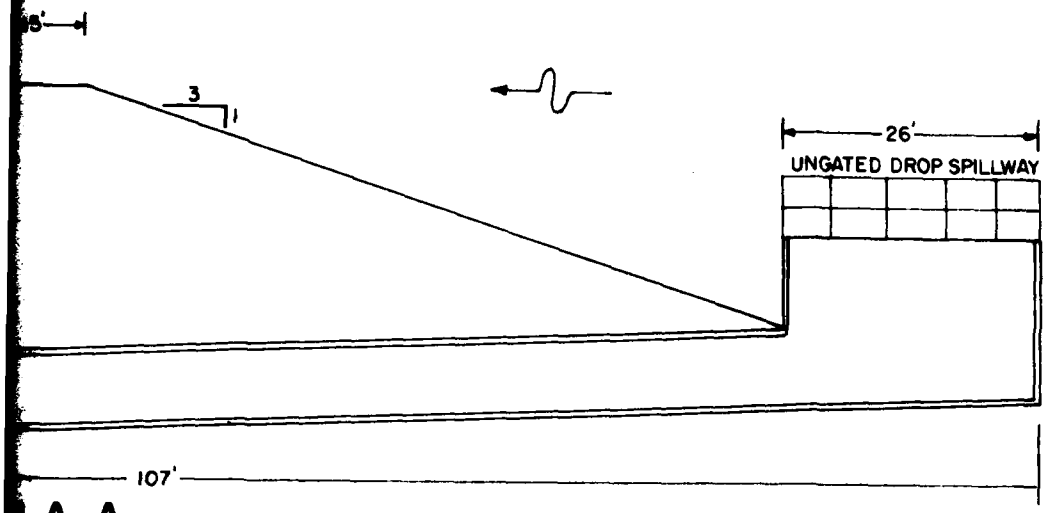


SECTION A-A

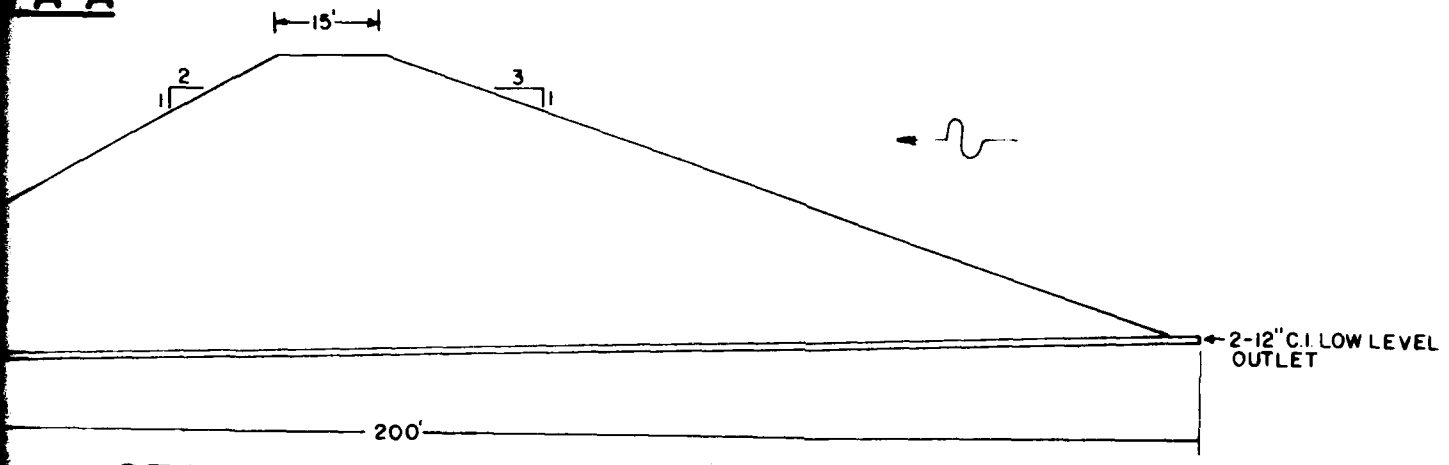


SECTION B-B

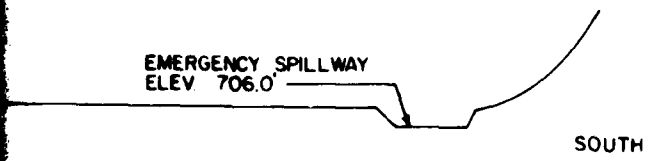
ELEVATION C-C



A-A



SECTION B-B



ON C-C

DETAIL FROM DESIGN PLANS AND FIELD INSPECTION 11/6/79

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NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

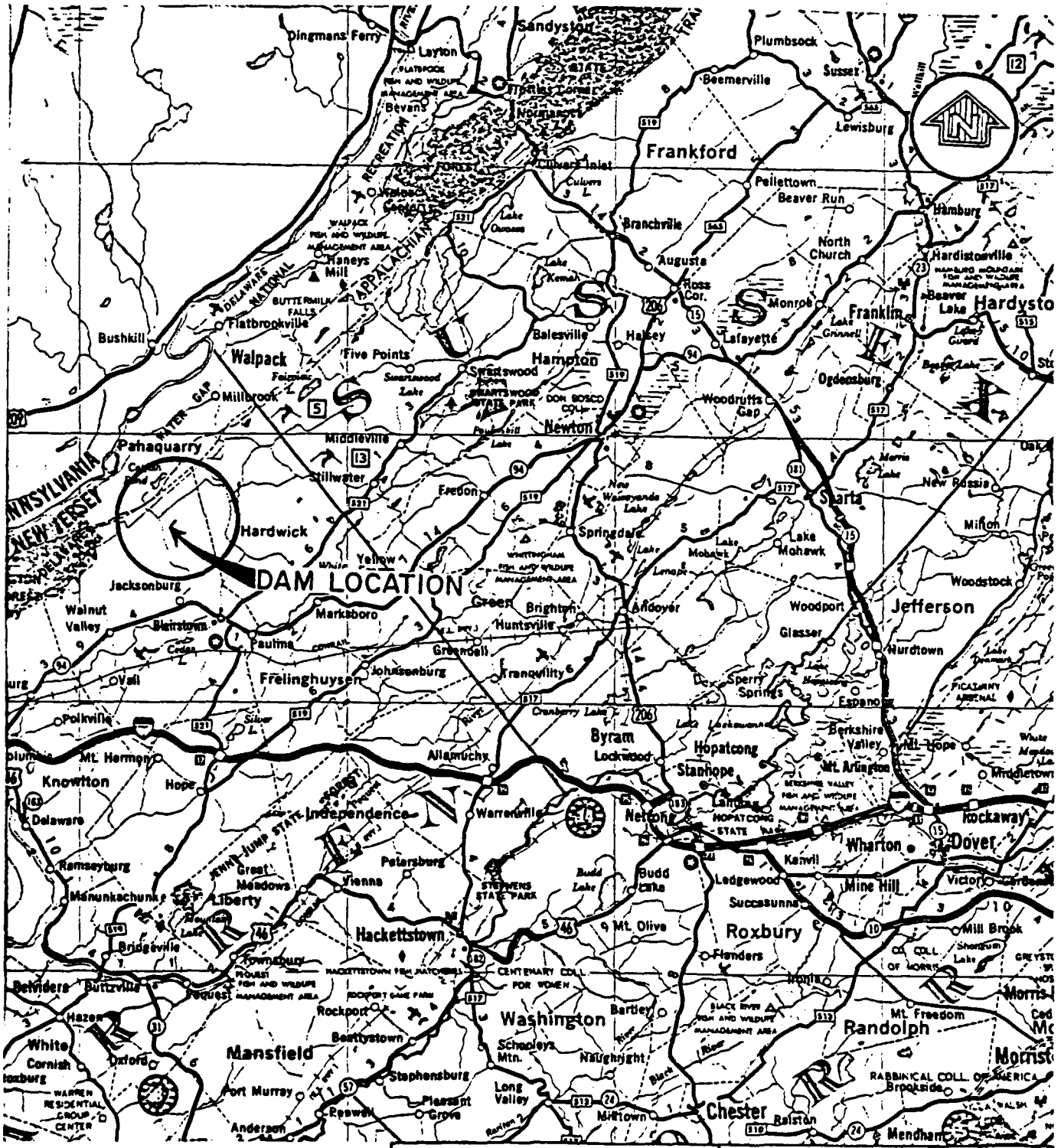
YOUNGS POND DAM

JACKSONBURG CREEK NEW JERSEY

SCALE: NOT TO SCALE

DATE: JANUARY 1980

FIGURE 2



Anderson-Nichols & Co., Inc.
CONCORD NEW HAMPSHIRE

U.S. ARMY ENGINEER DIST. PHILADELPHIA
CORPS OF ENGINEERS
PHILADELPHIA, PA.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

YOUNGS POND DAM
LOCATION MAP

JACKSONBURG CREEK NEW JERSEY

SCALE: SEE BAR SCALE
DATE: JANUARY 1980

SCALE IN MILES
0 5 10

MAP BASED ON STATE OF NEW JERSEY OFFICIAL HIGHWAY MAP AND GUIDE.

FIGURE-3

APPENDIX 1

VISUAL INSPECTION

CHECKLIST

YOUNGS POND DAM

Check List
Visual Inspection
Phase 1

Name Dam Youngs Pond Dam County Warren State N.J. Coordinators NJDEP

Date(s) Inspection 6 November 1979 Weather cloudy Temperature 35°

Pool Elevation at Time of Inspection 698.2 NGVD Tailwater at Time of Inspection 688.9 NGVD

Inspection Personnel:

Warren Guinan	Ronald Hirschfeld
Steve Gilman	K. Young, Owner
Ken Stuart	

Gilman/Hirschfeld Recorder

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None observed.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None observed.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Erosion rills on both upstream and downstream slopes. Do not appear to be actively eroding. Grass and weeds now growing in most of the rills.	Repair erosion and establish grassy vegetation.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	Good.	No action required.
RIPRAP FAILURES	No riprap.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
RAILINGS	No railings.	
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Some erosion at upstream and downstream slope contacts with south abutment; does not appear to be currently active. Wheel tracks down downstream slope adjacent to north abutment are covered with grassy vegetation.	Repair erosion and establish grassy vegetation.
ANY NOTICEABLE SEEPAGE	Standing water at toe of dam near north abutment. Extensive clear seepage around perimeter of small basin between low-level outlet and small weir immediately downstream of low-level outlet.	Engage engineer to study sources of standing water and seepage and to design remedial measures if needed.
STAFF GAGE AND RECORDER	None observed.	
DRAINS	None observed. Owner says none were installed.	

UNGATED SPILLWAY
DROP-INLET SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Good condition. No indication of deterioration.	
APPROACH CHANNEL	Clear and unobstructed.	
DISCHARGE CHANNEL	One log across channel. Some trees overhanging channel.	Clear trees and brush from either side of discharge channel a sufficient distance to prevent fallen trees from blocking the channel. Maintain the channel free of debris.
BRIDGE AND PIERS OVER SPILLWAY	Aluminum railings around ungated drop spillway in good condition.	

EMERGENCY SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	None.	
APPROACH CHANNEL	Clear and unobstructed.	
DISCHARGE CHANNEL	Several logs and some cut brush lying in channel. Trees growing on downstream valley slope beyond end of discharge channel. Bedrock exposed in bottom and left bank of channel just downstream of dam axis.	Clear debris from channel and maintain channel clear. Clear trees from downstream valley slope beyond end of discharge channel.
BRIDGE AND PIERS OVER SPILLWAY	None.	

LOW-LEVEL OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Concrete in good condition.	No action required.
INTAKE STRUCTURE	Not applicable.	
OUTLET PIPE	Two 12" ductile pipes in good condition.	No action required.
OUTLET CHANNEL	One log lying across channel. Some trees overhanging channel.	Clear trees and brush from either side of discharge channel a sufficient distance to prevent fallen trees from blocking the channel. Maintain the channel free of debris.
EMERGENCY GATE	Vales for two 12" ductile pipes are operable. Owner reports recent operation. No leakage was observed in outlet pipe.	Valves are on downstream end of pipes.

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Logging operation underway on right bank upstream of dam. Sedimentation pond being used to control erosion from logging area. Other slopes are wooded.	
SEDIMENTATION	No evidence of significant sedimentation observed.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Some trees overhang the discharge channel downstream from the low-level outlet and one tree has fallen across the channel.	Clear trees which overhang discharge channel.
SLOPES	Steep narrow valley.	
APPROXIMATE NO. OF HOMES AND POPULATION	Three homes in Jacksonburg Creek flood-plain adjacent to Jacksonburg Road approximately 2.5 miles downstream of dam. Estimated population of 10 persons.	Inundation will increase significantly under breach of dam. Velocity of flow will be very high.

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None observed.	
OBSERVATION WELLS	None observed.	
WEIRS	Small weir located downstream of low-level outlet but it is not used for measuring flow.	
PIEZOMETERS	None observed.	
OTHER	None observed.	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

ITEM	REMARKS
PLAN OF DAM	Plans for this report were developed from visual inspection 6 Nov. 1979 and a set of original design plans by Morris Engineers, Inc., P.O. Box 289, Ledgewood, N.J. 07852 dated 4 January 1972.
REGIONAL VICINITY MAP	Prepared for this report.
CONSTRUCTION HISTORY	Records retrieved from NJDEP revealed design plans from Morris Engineers, Inc., no other records were retrieved.
TYPICAL SECTIONS OF DAM	Sections of dam were developed from design plans by Morris Engineers.
HYDROLOGIC/HYDRAULIC DATA	Original hydrologic/hydraulic was revealed in Morris Engineers design of principal drop spillway.
OUTLETS - PLAN	From Morris Engineers, Inc. 1972 design plans.
- DETAILS	From Morris Engineers, Inc. 1972 design plans.
- CONSTRAINTS	None disclosed.
- DISCHARGE RATINGS	From Morris Engineers computations which accompany dam application 29 June 1972.
RAINFALL/RESERVOIR RECORDS	Reservoir acreages vs. reservoir elevations from letter by Morris Engineers dated 18 September 1972.

ITEM	REMARKS
DESIGN REPORTS	Original design plans from Morris Engineers 4 January 1972.
GEOLOGY REPORTS	None disclosed.
DESIGN COMPUTATIONS	From Morris Engineers computations which accompany dam application 29 June 1972.
HYDROLOGY & HYDRAULICS	
DAM STABILITY	
SEEPAGE STUDIES	None disclosed.
MATERIALS INVESTIGATIONS	Boring log information on design plans by Morris Engineers 4 January 1972.
BORING RECORDS	
LABORATORY	
FIELD	
POST-CONSTRUCTION SURVEYS OF DAM	None disclosed.
BORROW SOURCES	Unknown.

ITEM	REMARKS
MONITORING SERVICES	Unknown.
MODIFICATIONS	Emergency spillway added by owner Kenneth W. Young. Emergency spillway not shown on design plans or in documents retrieved at NJDEP.
HIGH POOL RECORDS	None disclosed.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None disclosed.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None disclosed.
MAINTENANCE OPERATION RECORDS	None disclosed.

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	Plans and sections for this report were developed from visual inspection 6 November 1979 and a set of original design plans by Morris Engineers dated 4 January 1972.
OPERATING EQUIPMENT	2-12" ductile iron low-level outlet.
PLANS & DETAILS	Plans and details for this report were developed from visual inspection 6 November 1979 and a set of original design plans by Morris Engineers dated 4 January 1972.

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 4.5 square miles moderately to steeply sloping and heavily wooded

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 698.2(NGVD) 172 acre-feet

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 707.3(NGVD) 490 acre-feet

ELEVATION MAXIMUM DESIGN POOL: 710.4 (NGVD) (½ PMF)

ELEVATION TOP DAM: 707.3 (NGVD)

PRINCIPAL DROP SPILLWAY CREST: Rectangular free overflow flat crested concrete drop

a. Elevation 698.2

b. Type drop

c. Circumference 62 feet

d. Location Spillover 50 feet from south abutment, 8 feet into pond

e. Number and Type of Gates none

EMERGENCY SPILLWAY CREST: Free overflow excavated channel

a. Elevation 706.0

b. Type free overflow

c. Width 20 feet

d. Length 410 feet

e. Location adjacent to south abutment

f. Number and Type of Gates none

OUTLET WORKS: Low-level outlet

a. Type 2-12" cast iron pipes

b. Location 250 feet from north abutment

c. Entrance Inverts unknown

d. Exit Inverts 680.2

e. Emergency Draindown Facilities described above

HYDROMETEORLOGICAL GAGES: none disclosed

a. Type

b. Location

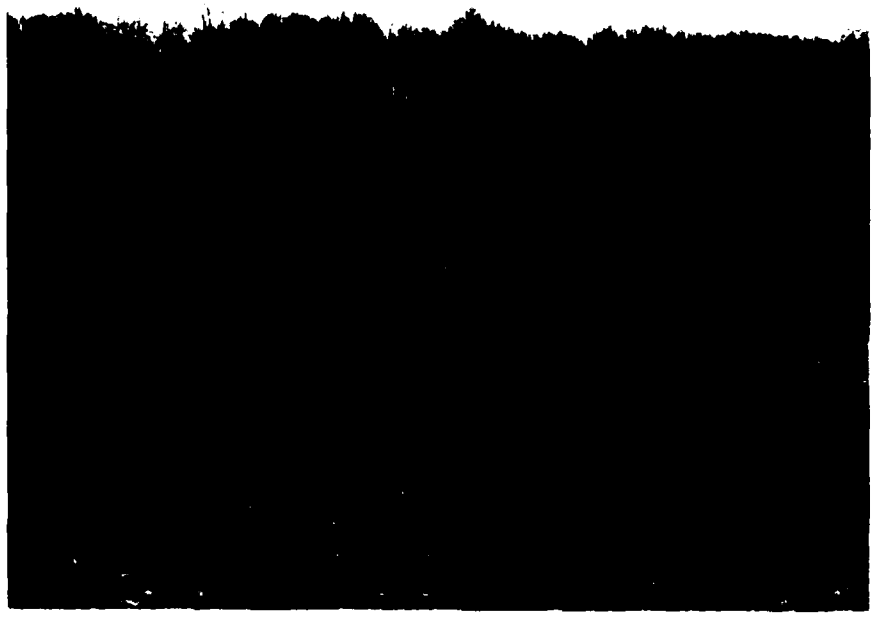
c. Records

MAXIMUM NON-DAMAGING DISCHARGE: 1150 cfs

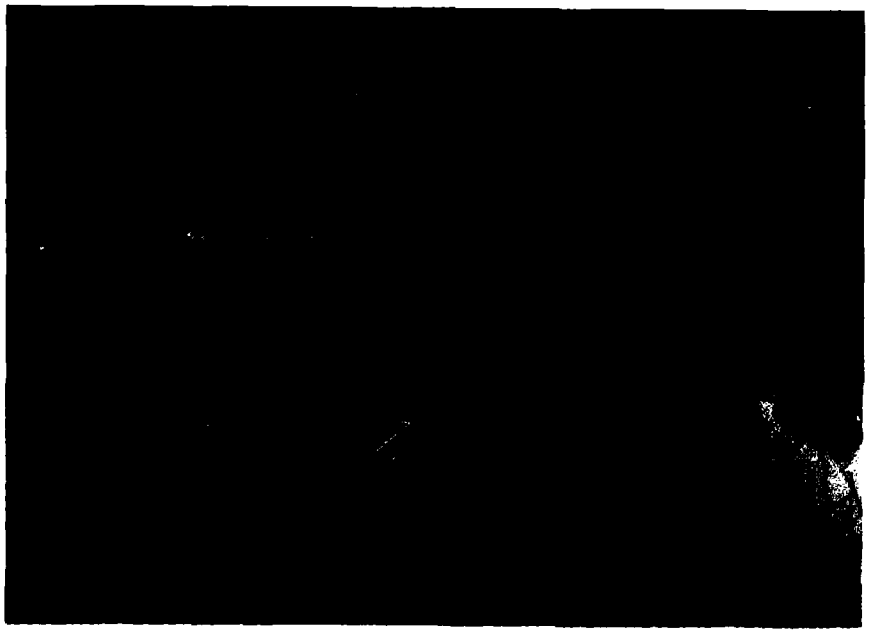
APPENDIX 2

PHOTOGRAPHS

YOUNGS POND DAM



6 NOVEMBER 1979
VIEW FROM NORTH ABUTMENT LOOKING ALONG DAM CREST TO SOUTH ABUTMENT. NOTE FALLEN TREES IN RECENTLY EXCAVATED EMERGENCY SPILLWAY.



6 NOVEMBER 1979
VIEW FROM SOUTH EDGE OF RESERVOIR LOOKING AT PRINCIPAL DROP SPILLWAY.

6 NOVEMBER 1979
VIEW FROM SOUTH EDGE OF RESERVOIR LOOKING AT EMERGENCY SPILLWAY CHANNEL. NOTE ERODABLE BANK AND FALLEN TREES.

6 NOVEMBER 1979
FROM THE SOUTH EDGE OF RESERVOIR LOOKING AT THE UPSTREAM FACE OF DAM.

6 NOVEMBER 1979

VIEW SHOWING THE OUTLET AND STEPPED DISCHARGE CHANNEL FROM THE PRINCIPAL DROP SPILLWAY. NOTE BRUSH AND GRASS ON DOWNSTREAM FACE OF DAM.

6 NOVEMBER 1979

LOW-LEVEL OUTLET PIPES

YOUNGS POND DAM

6 NOVEMBER 1979
VIEW FROM SOUTH ABUTMENT SHOWING UPSTREAM FACE OF DAM.

6 NOVEMBER 1979
VIEW FROM SOUTH SIDE AND DOWNSTREAM OF DAM SHOWING DOWNSTREAM FACE OF DAM, SPILLWAY DISCHARGE CHANNEL AND PLANTED PINE TREES IN FOREGROUND.

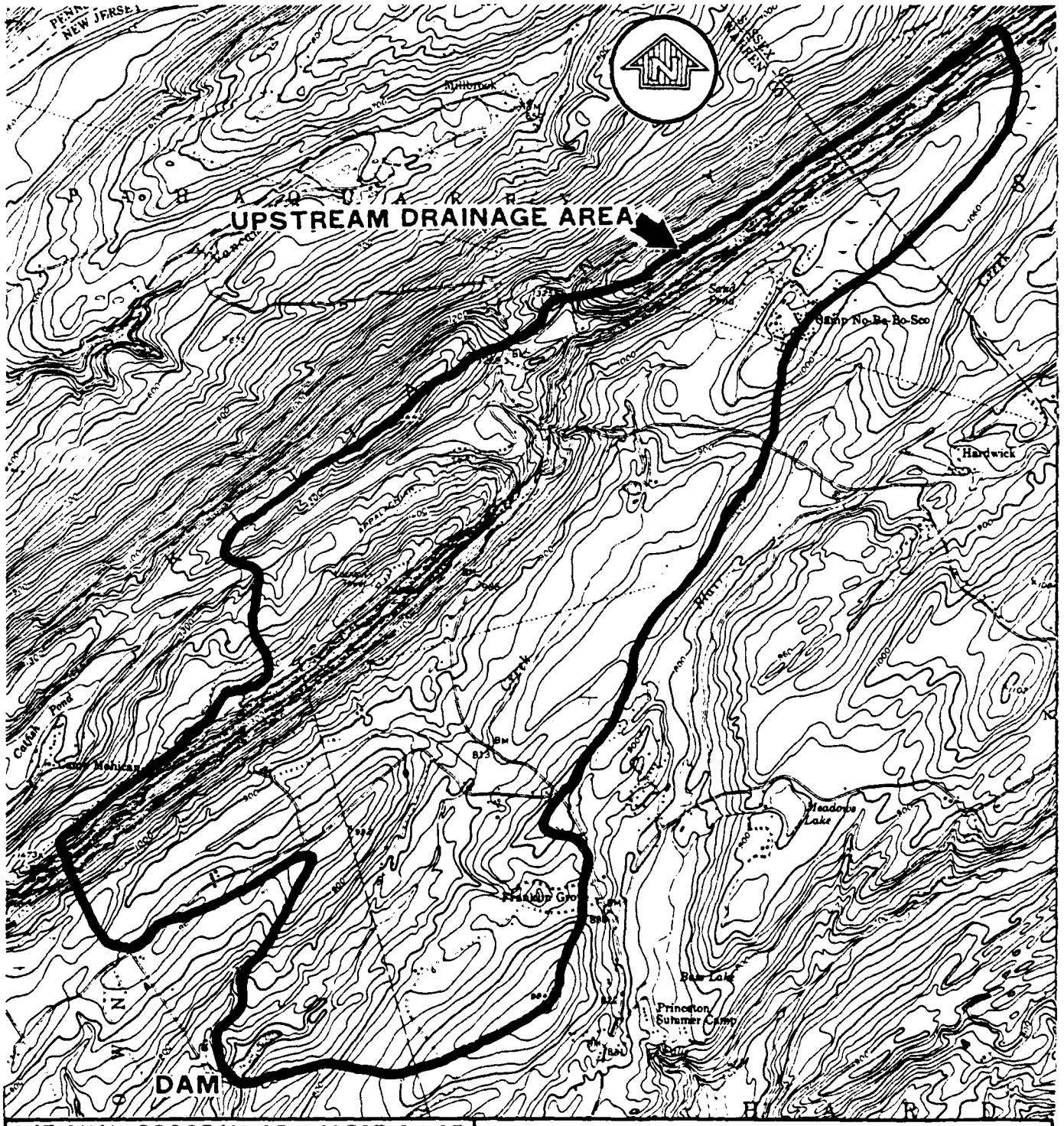
6 NOVEMBER 1979
VIEW FROM DAM CREST LOOKING DOWNSTREAM AT STEPPED SPILLWAY DISCHARGE CHANNEL AND LOW-LEVEL OUTLET CHANNEL.

6 NOVEMBER 1979
VIEW FROM DAM CREST LOOKING UPSTREAM AT YOUNGS POND.

APPENDIX 3

HYDROLOGIC COMPUTATIONS

YOUNGS POND DAM



NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

YOUNGS POND DAM

JACKSONBURG, NEW JERSEY

REGIONAL VICINITY MAP

JANUARY 1980

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
PHILADELPHIA, PENNSYLVANIA

ANDERSON-NICHOLS & CO., INC CONCORD, NH

SCALE IN MILES

0 1/2 1

MAP BASED ON U.S.G.S. 7.5 MINUTE QUADRANGLE SHEET. FLATBROOKVILLE, N.J.-N.Y. 1954. REVISED 1971.

Anderson-Nichols & Company, Inc.

JOB NO. 3409-15

Subject H & H

YOUNGS POND DAM

Sheet No. 1 of 16
Date 1/90
Computed KJS
Checked TDD

SQUARES 1/4 IN SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

HYDROLOGIC COMPUTATIONS

NAME : YOUNGS POND DAM

LOCATION : WARREN COUNTY, NEW JERSEY

DRAINAGE AREA : 4.5 SQUARE MILES

SURFACE AREA : 14 ACRES

EVALUATION CRITERIA : SIZE : SMALL

HAZARD : HIGH

SPILLWAY DESIGN FLOOD : BASED ON SIZE AND HAZARD CLASSIFICATION THE SPILLWAY DESIGN FLOOD WILL BE THE 1/2 PMF (PROBABLE MAXIMUM FLOOD) WITH A PEAK INFLOW OF 8165 CFS.

SQUARES 1/4 IN SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

TIME OF CONCENTRATION

YOUNGS POND DAM BASIN

OVERLAND FLOW LENGTH = 6500'

ELEVATION DIFFERENCE FROM WATERSHED DIVIDE TO THE JACKSONBURG CREEK STREAM THREAD = 520'

SLOPE FOR OVERLAND FLOW = .080 OR 8.0%

ALSO

LENGTH OF STREAMFLOW (JACKSONBURG CREEK) FROM THE END OF OVERLAND FLOW TO THE INLET = 22000'

ELEVATION DIFFERENCE FROM END OF OVERLAND FLOW TO THE INLET = 282'

SLOPE FOR THIS SECTION OF JACKSONBURG CREEK = .0128 OR 1.3%

ALSO

THE REPRESENTATIVE CROSS SECTION FOR THE BASIN WAS DRAWN TO DETERMINE AN APPROXIMATE STREAMFLOW VELOCITY AT A WATER DEPTH OF 6'

SQUARES 1/4 IN. SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

TIME OF CONCENTRATION (CONT.)

REPRESENTATIVE SECTION (CONT.)

AREA OF CROSS SECTION = 40 SQ.FT.

WETTED PERIMETER = 22.1 FT.

HYDRAULIC RADIUS = 1.8 FT.

CHANNEL "n" = .055

OVERBANK "n" = .075

$$V = \frac{1.49}{n} (R)^{2/3} (S)^{1/2}$$

$V = 4.5$ fps

THE TIME OF CONCENTRATION FOR STREAMFLOW OF JACKSONBURG CREEK = $\frac{22000}{4.5(60)}$ = 81.5 MINUTES

Anderson-Nichols & Company, Inc.

Subject H&H

Sheet No. 4 of 16
Date 1190
Computed KJS
Checked TDD

JOB NO. 3409-15

YOUNGS POND DAM

SQUARES 1/4 IN SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

TIME OF CONCENTRATION (CONT.)

THREE METHODS FOR DETERMINING T_c ARE AVERAGED

WESTON

$L = 6500'$

$S = .080$

$V = 1.8$ fps

$\frac{6500}{1.8(60)} = 60.2$ FOR T_c OVERLAND + 81.5 MIN = 2.4 HOURS

$T_c = 2.4$ HRS.

KERBY

$$T_c = 0.83 \left(\frac{NL}{\sqrt{S}}\right)^{0.467}$$

$$T_c = .83 \left(\frac{.6\,(6500)}{\sqrt{.080}}\right. = 71.1 \text{ MIN. FOR } T_c \text{ OVERLAND} + 81.5 \text{ MIN} = 152.6$$

$T_c = 2.5$ HRS.

SQUARES 1/4 IN. SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

TIME OF CONCENTRATION (CONT.)

DESIGN OF SMALL DAMS

USING TEXAS HIGHWAY CHARTS FOR VELOCITIES

CHANNEL VELOCITY = 3.0 fps, OVERLAND VELOCITY = 3.0 fps

LENGTH (OVERLAND) = 6500'

LENGTH (STREAM) = 22000'

$T_C = \frac{28500}{3}$ = 9500 SEC. = 158 MIN.

T_C = 2.6 HRS.

AVERAGE T_C FOR YOUNGS POND BASIN = 2.5 HOURS

T_L FOR YOUNGS POND BASIN = 1.5 HOURS

Anderson-Nichols & Company, Inc.

JOB NO. 3409-15

Subject H&H

YOUNGS POND DAM

Sheet No. 6 of 16
Date 1/80
Computed RJS
Checked FDD

SQUARES 1/4 IN SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

△ STORAGE - ELEVATION DETERMINATION

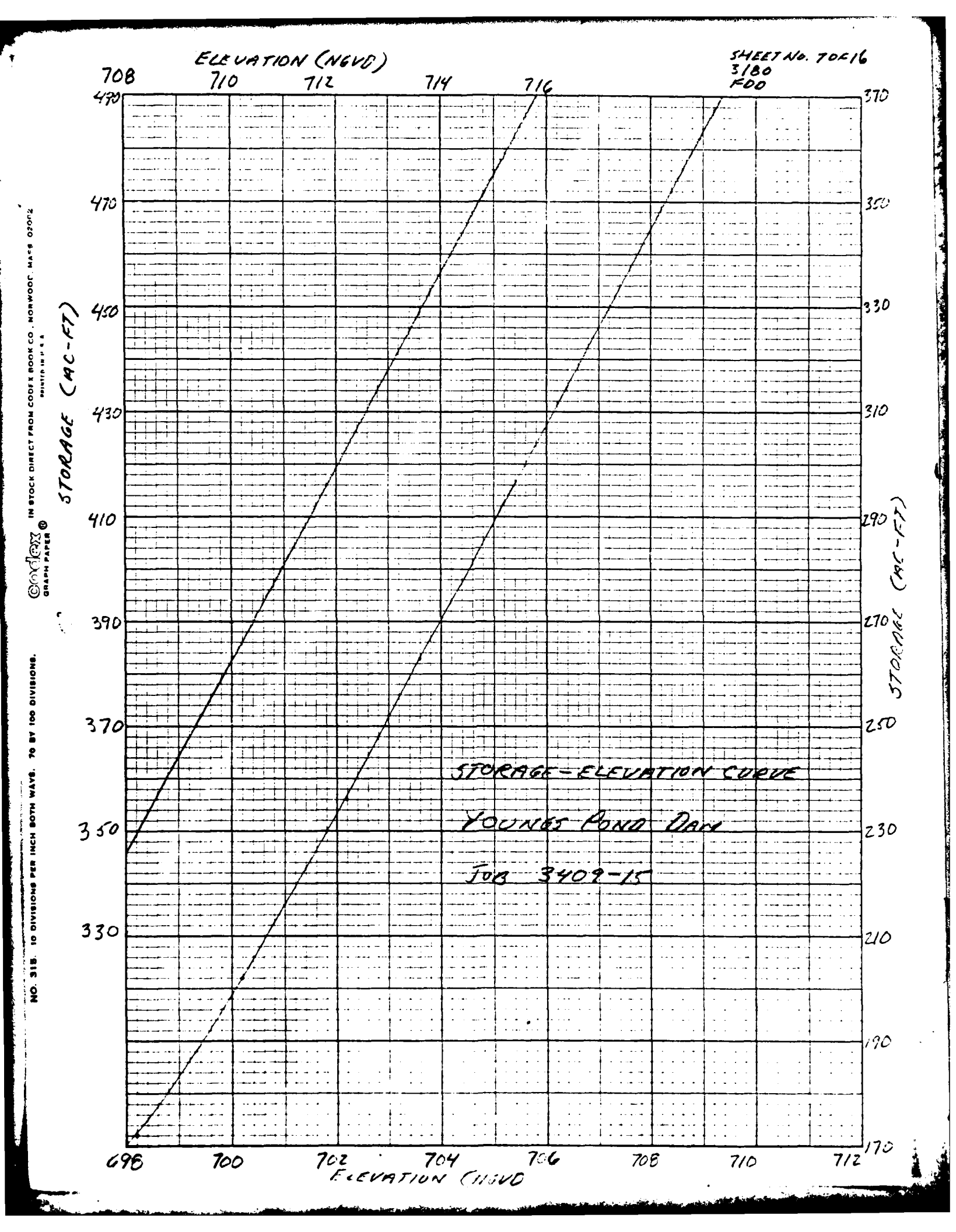
ELEVATION FEET	AREA ACRES	ΔH FT.	AVG. AREA ACRES	Δ STORAGE ACRE-FT.	STORAGE ACRE-FT.
698.2	14				172
		2	15	30	
700.2	16				202
		2	17	34	
702.2	18				236
		1.4	19	27	
703.6	20				263

△△ MAXIMUM RESERVOIR DEPTH @ 698.2 = 19'

AVERAGE RESERVOIR DEPTH @ 698.2 = 12'

△ FROM LETTER BY MORRIS ENGINEERS INC., 18 SEPT. 1972

△△ FROM "REPORT ON DAM APPLICATION, 29 JUNE 1972


ELEVATION (NGVD)
SHEET No. 7 OF 16
3180
FDO
708
710
712
714
716
STORAGE (AC-FT)
470
450
430
410
390
370
350
330
STORAGE (AC-FT)
370
350
330
310
290
270
250
230
210
190
170
STORAGE-ELEVATION CURVE
YOUNGS POND DAM
JOB 3402-15
698
700
702
704
706
708
710
712
ELEVATION (NGVD)
NO. 315. 10 DIVISIONS PER INCH BOTH WAYS. 70 BY 100 DIVISIONS.
IN STOCK DIRECT FROM CODEX BOOK CO., NORWOOD, MASS 02062
GRAPH PAPER

Anderson-Nichols & Company, Inc.

Subject H & H

Sheet No. 8 of 16
Date 2/80
Computed FDD
Checked

JOB NO. 3409-15

YOUNGS POND DAM

SQUARES 1/4 IN SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

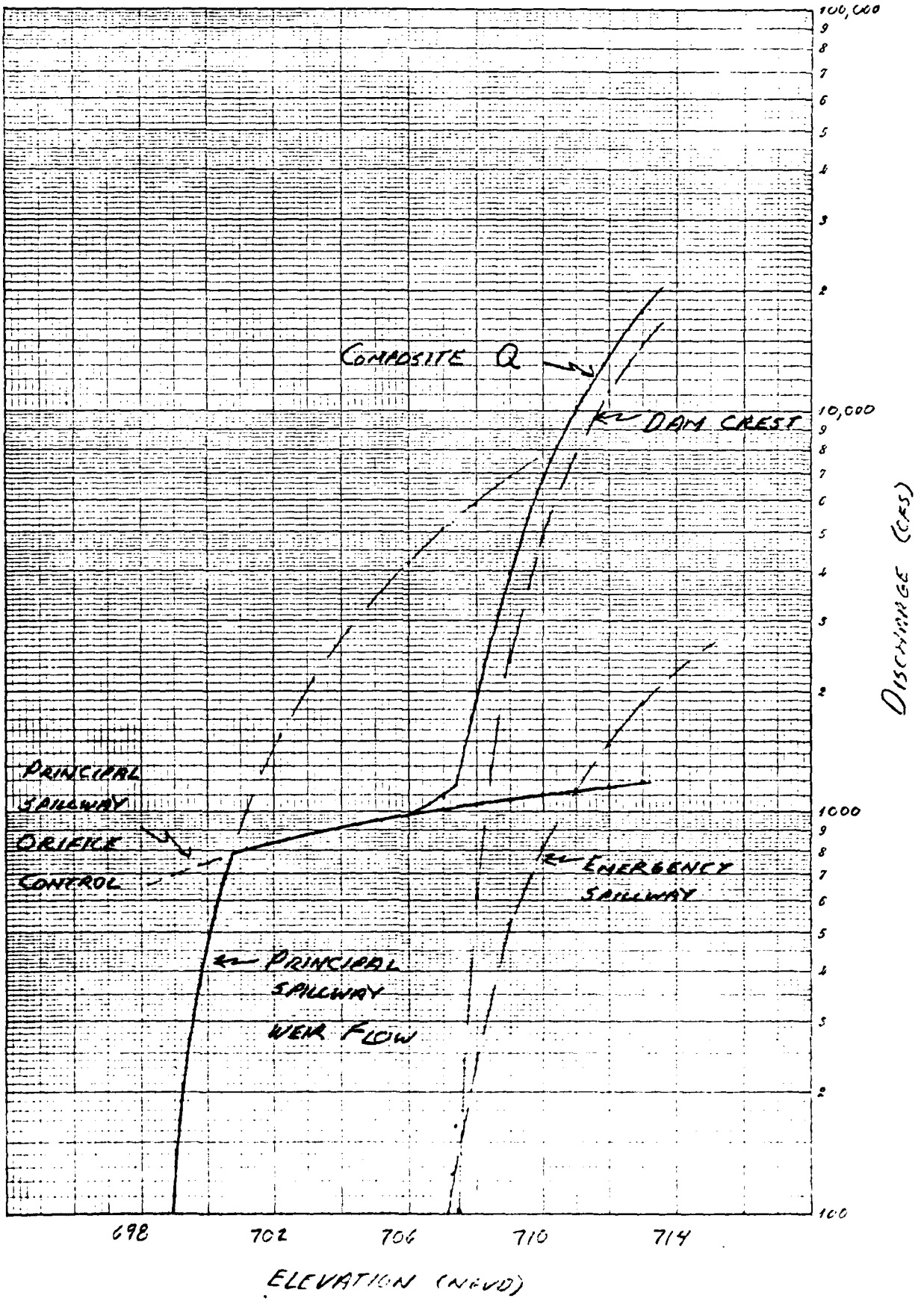
SPILLWAY CAPACITY

YOUNGS POND DAM HAS TWO UNCONTROLLED SPILLWAYS. THE PRINCIPAL DROP SPILLWAY CAPACITY IS CONTROLLED BY WEIR DISCHARGE UP TO ELEVATION 700.8. ABOVE 700.8 CAPACITY IS CONTROLLED BY THE 8 X 7 FOOT OUTLET CONDUIT ENTRANCE (ORIFICE FLOW). THE SLOPE OF THE OUTLET CONDUIT IS GREATER THAN CRITICAL FOR ALL DISCHARGES THUS SURFACE FRICTION IS NOT A FACTOR. THE CALCULATIONS BELOW DO NOT AGREE WITH PRINCIPAL SPILLWAY ANALYSIS BY MORRIS ENGINEERS INC. WHERE ONLY WEIR FLOW WAS CONSIDERED.

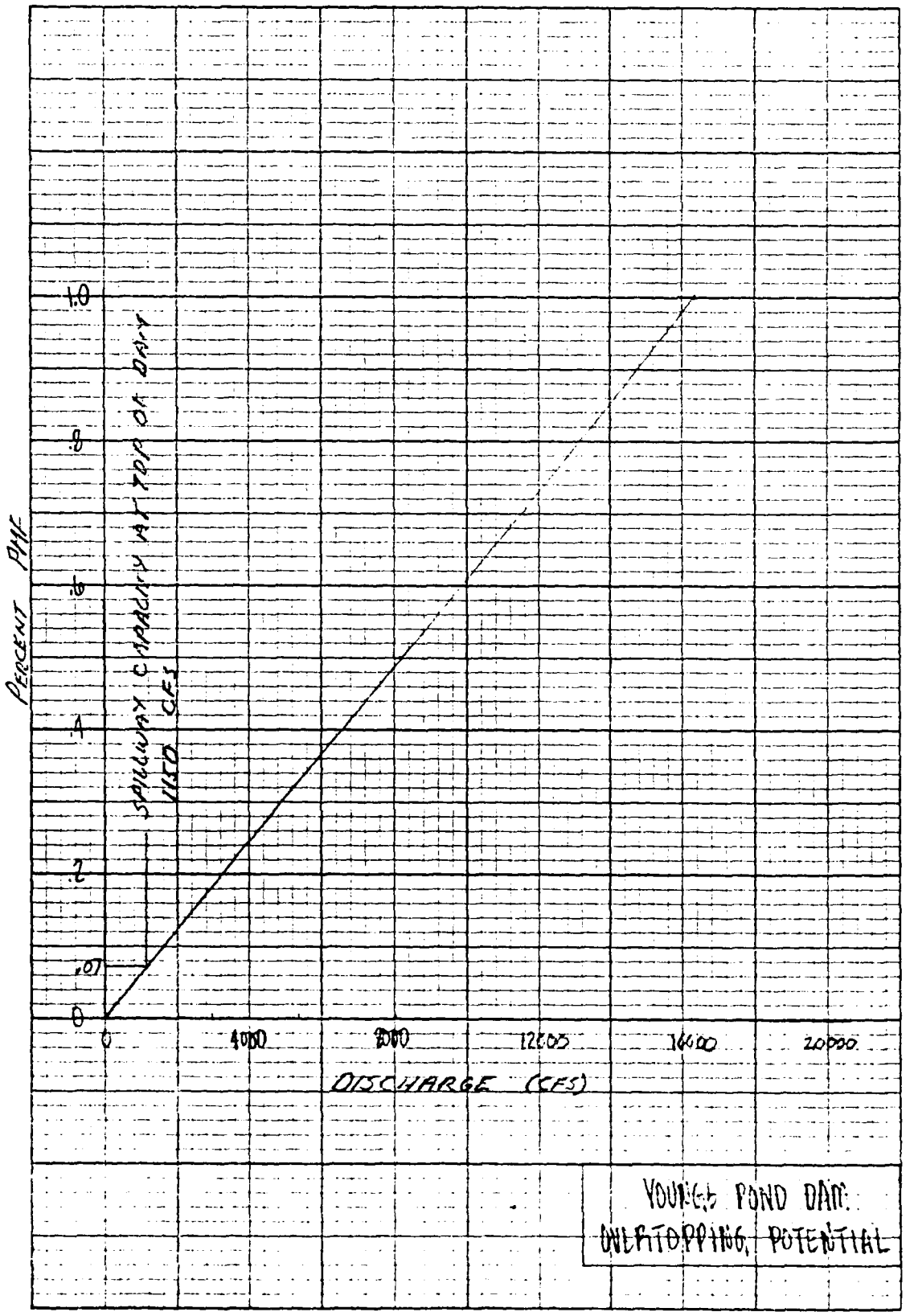
ELEVATION NGVD	PRINCIPAL SPILLWAY							EMERGENCY SPILLWAY			DAM CREST			TOTAL Q (CFS)
	WEIR FLOW		ORIFICE FLOW											
	H	Q	D	HW	HW/D	C/C	Q	H	L	Q	H	L	Q	
696.2	0	0	7	11.6	1.66	-	-							0
699.2	1	190	7	12.6	1.8	88	704							190
700.2	2	540	7	13.6	1.94	95	760							540
701.2	3	1000	7	14.6	2.09	101	808*							808
702.2	4	1540	7	15.6	2.22	105	840							840
703.2	5	2150	7	16.6	2.37	110	880							880
704.2	6	2825	7	17.6	2.51	115	920							920
705.2	7	3560	7	18.6	2.66	119	952							952
706.0	7.8	4190	7	19.4	2.77	122	976	0	0	0				976
707.0	8.8	5020	7	20.4	2.91	126	1010	1	28	78				1088
707.3	9.1	5260	7	20.7	2.96	128	1025	1.3	30	125	0	385	0	1150
708.0	9.8	[illegible]	7	21.4	3.06	130	1040	2	30	240	1.7	405	610	1890
709.0	10.8	6820	7	22.4	3.2	133	1065	3	36	525	1.7	410	2365	3955
710.0	11.8	7790	7	23.4	3.34	137	1100	4	36	810	2.7	420	4845	6755
711.0	12.8	8800	7	24.4	3.49	140	1120	5	36	1130	3.7	420	7770	10020
712.0	13.8		7	25.4	3.63	144	1150	6	36	1480	4.7	420	11130	13760
713.0	14.8		7	26.4	3.77	149	1190	7	36	1870	5.7	420	14850	17920
	L=62' C=3.1							C=2.8			C=2.6			

*Orifice flow control begins - Reference FHA Hydraulic Eng. Circ. No. 5 Chart 2

SHEET No. 9/16
3180
FDD



SHT 10 OF 16
DATE: 1/80
BY: KJS
CHKD: FCO



SQUARES 1/4 IN SCALE

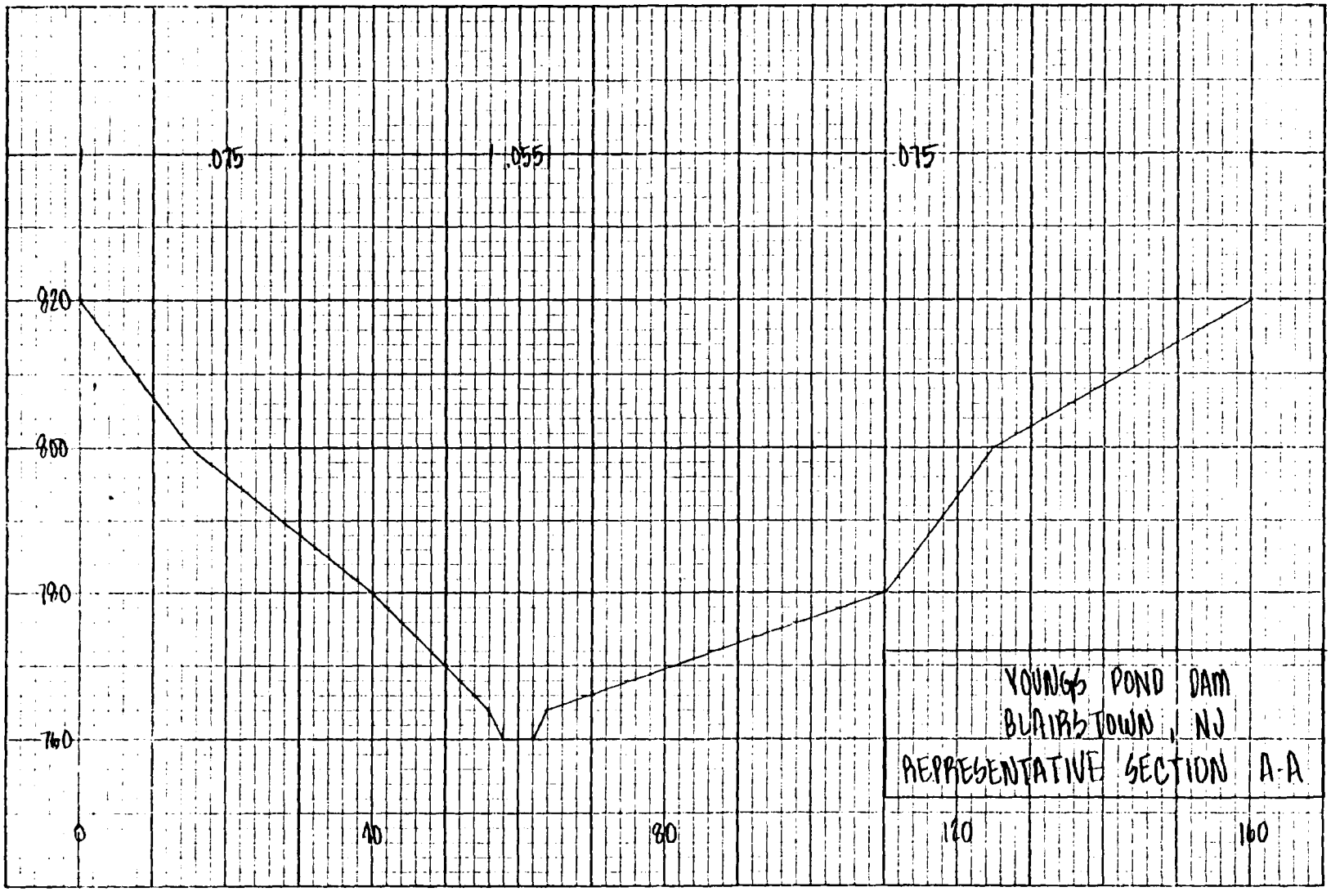
DRAWDOWN CALCULATIONS

CALCULATIONS ASSUME ① NO SIGNIFICANT INFLOW ② TWO - 12" DUCTILE IRON LOW LEVEL OUTLET TO BE FULLY OPERABLE ③ $Q_p = C_p(H^{1/2})$ ④ ACRE-FT./DAY = 1.9835 · (AVG. Q) ⑤ DAYS = Δ STOR / AC-FT./DAY

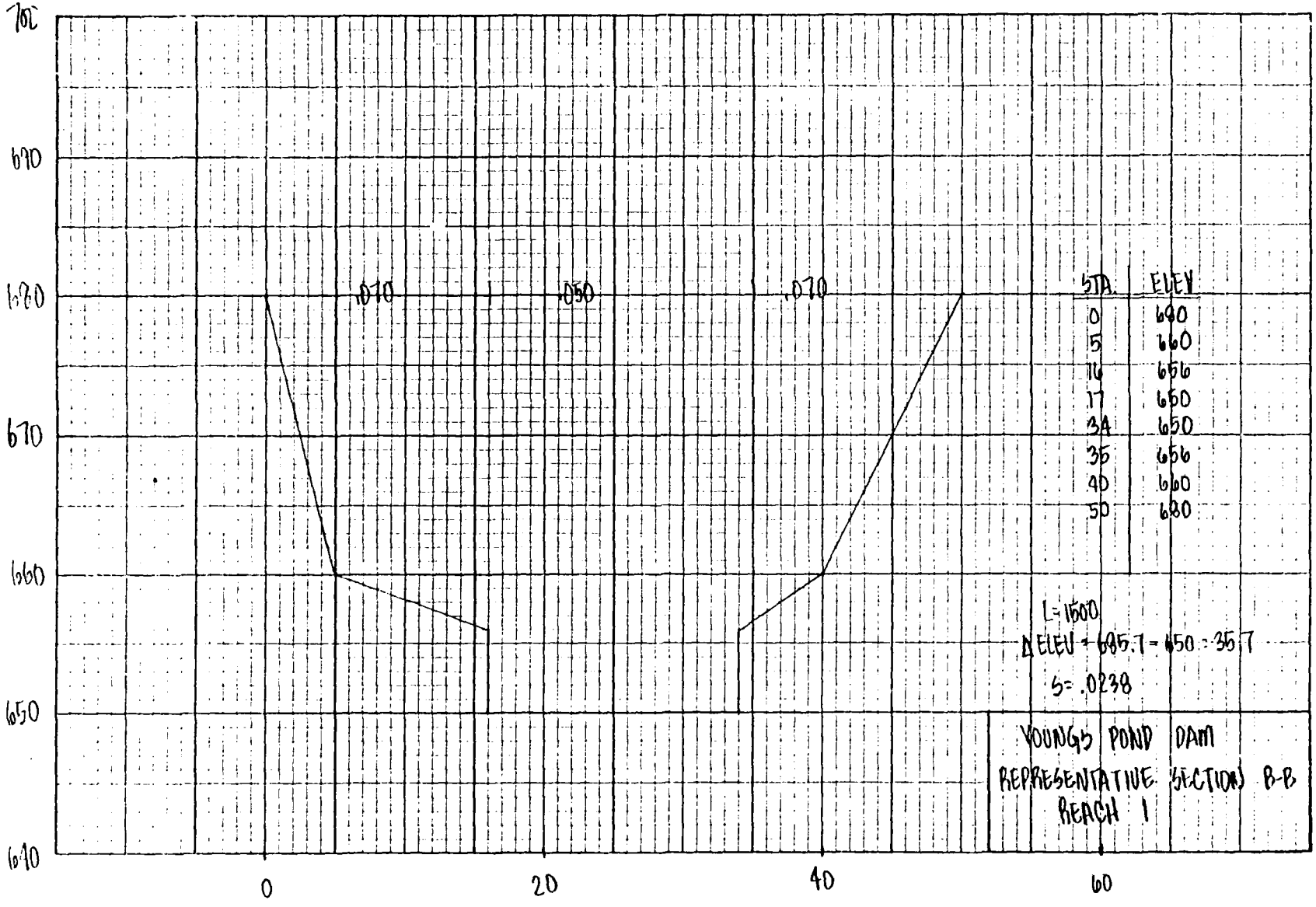
ELEVATION	STORAGE ACRE-FT.	Δ STOR. AC.-FT.	H FT.	Q CFS	AVG. Q	AC-FT/ DAY	DAYS
698	172		16	18.0			
		21			17.6	35.2	.6
696	151		14	17.1			
		22			16.5	33.0	.7
694	129		12	15.9			
		21			15.2	30.4	.7
692	108		10	14.5			
		22			13.8	27.6	.8
690	86		8	13.0			
		22			12.1	24.2	.9
688	64		6	11.2			
		21			10.2	20.4	1.0
686	43		4	9.2			
		21			7.9	15.8	1.3
684	22		2	6.5			
		22			3.3	6.6	3.3
682	0		0	0			

9.3 DAYS

$C_p = 2.29\,(2) = 4.58$



SHT. 12 OF 16
DATE: 1/80
BY: KJS
CHKD:

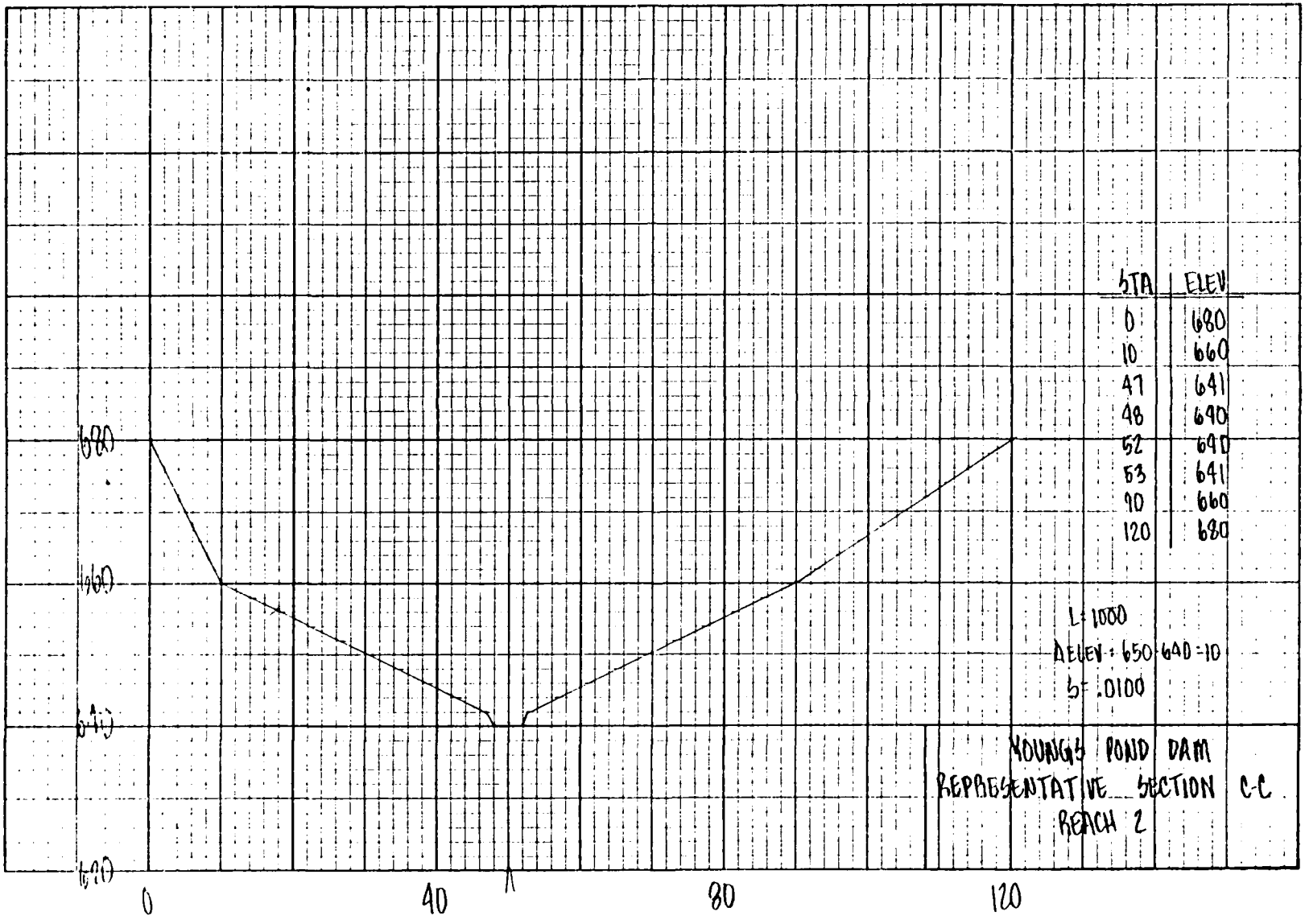


STA.	ELEV
0	690
5	660
16	656
17	650
34	650
35	656
40	660
50	680

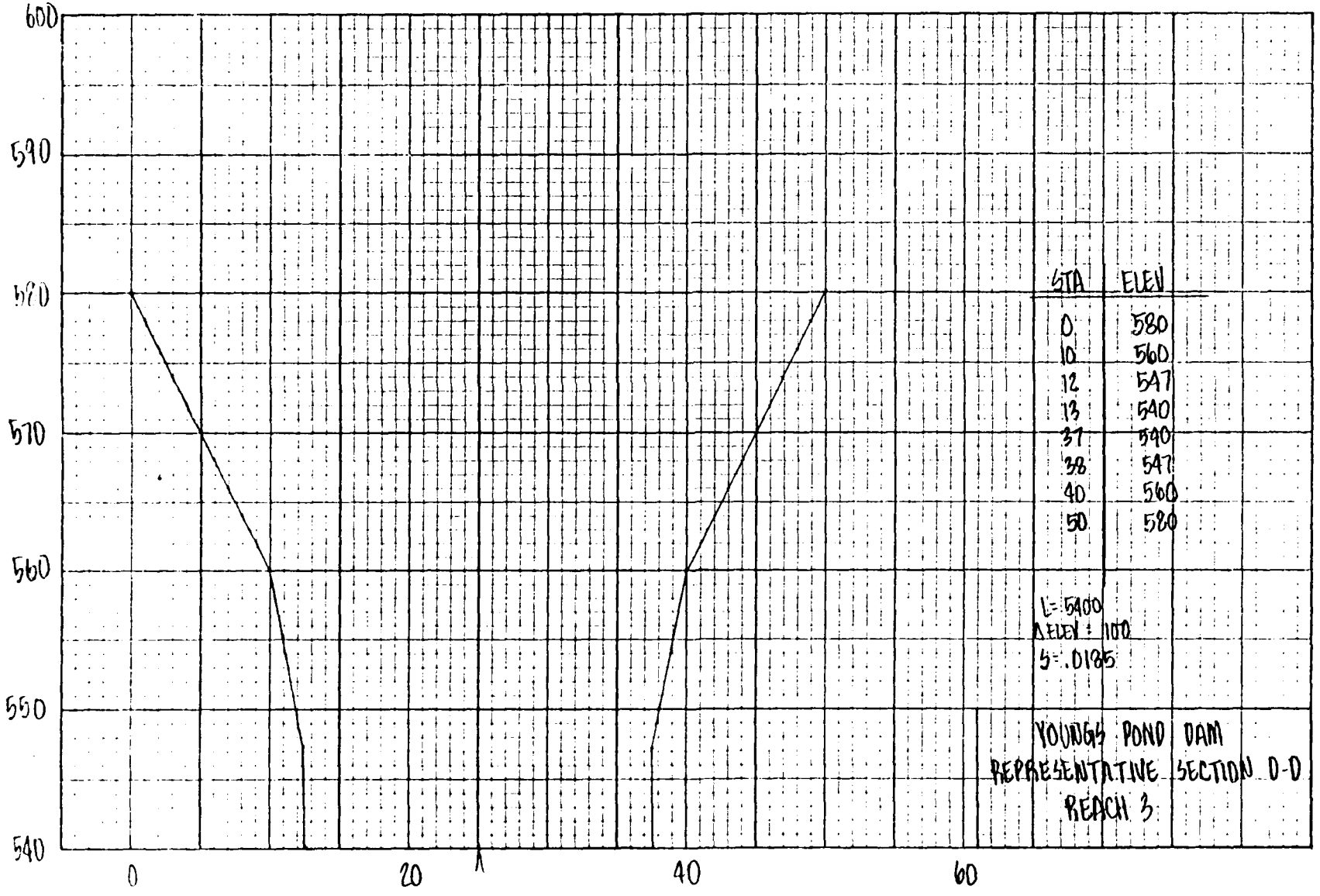
L = 1500
ΔELEV = 685.7 − 650 = 35.7
S = .0238

YOUNGS POND DAM
REPRESENTATIVE SECTION B-B
REACH 1

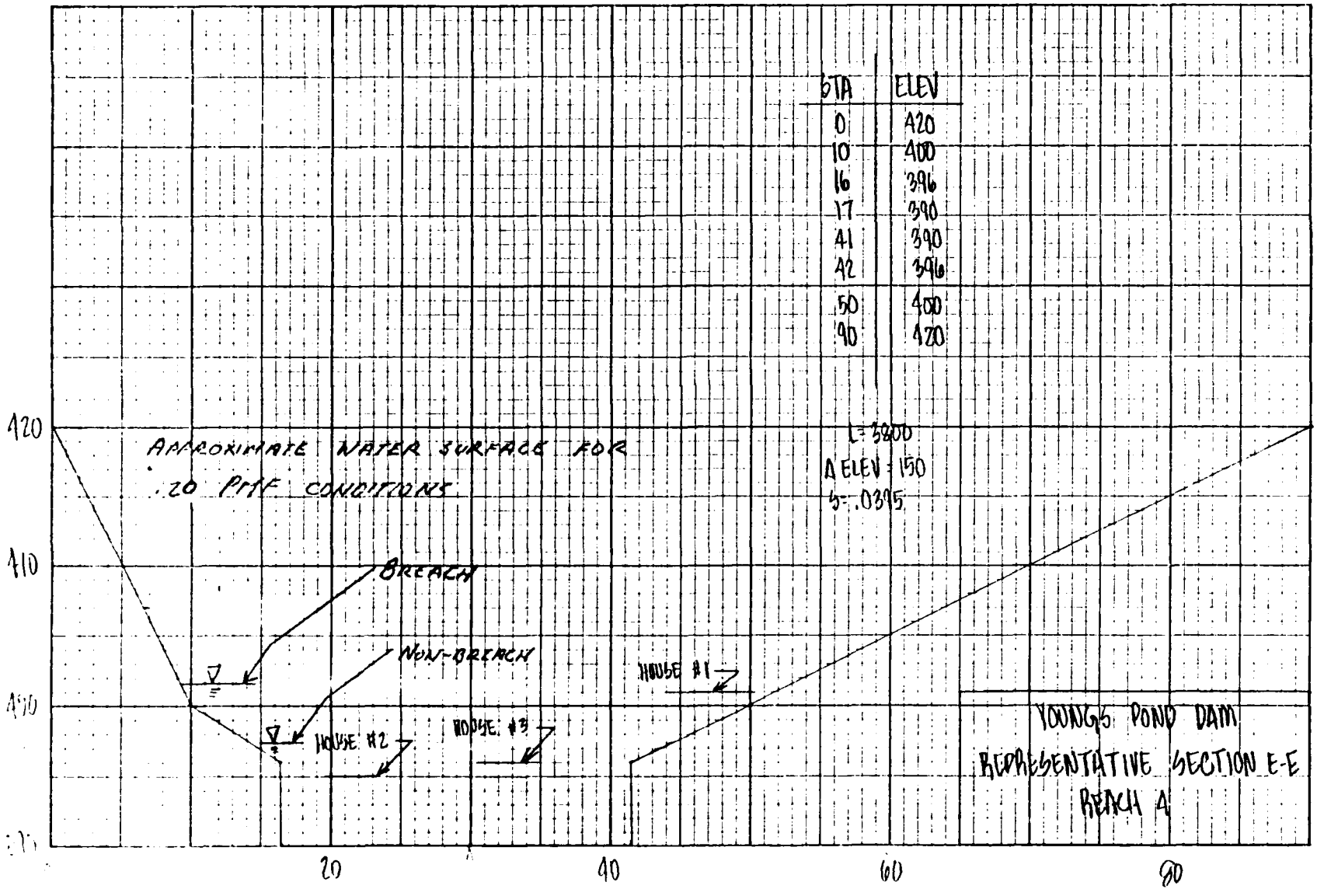
SHT. 13 OF 16
DATE: 11/80
BY: KJS
CHKD: TDD



SHT. 14 OF 16
DATE: 11/80
BY: KAS
CHKD: AFD



ENT. 15 OF 16
DATE: 1/80
BY: KJS
CHKD: FDD



SHT. 16 OF 16
DATE: 1/80
BY: KAS
CHKD:

HEC-1 INPUT/OUTPUT

OVERTOPPING AND BREACH ANALYSIS

YOUNGS POND DAM

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**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********************************
A1 YOUNGS POND DAM OVERTOPPING AND BREACH ANALYSIS *K.STUART*ANDERSON-NICHOLS*
A2 NEW JERSEY DAM NUMBER 615
A3 0.2,0.5 AND 1.0 MULTIPLES OF PMF FROM 25.4 INCH PMF
B    180       0      10       0       0       0       0       0       0       0
B1     5
J      2       3       1
J1    .2      .5      1.
K      0      A1                                       1
K1 YOUNGS POND INFLOW HYDROGRAPH
M      1       2     4.5                     .8                          1
P           25.4     113     123     132
T                                                      1      .1
W2           1.5
X     -3
K      1      A2                                       1
K1 ROUTE HYDROGRAPH THROUGH YOUNGS POND
Y                              1       1
Y1     1                                             172      -1
Y4 698.2   699.2   700.2   701.2   702.2   703.2   704.2   705.2   706.0   707.0
Y4 707.3   708.0   709.0   710.0   711.0    712.    713.
Y5    0.    190.    540.    808.    840.    880.    920.    952.    976.   1000.
Y5 1150.   1250.   3955.   6755.  10020.  13760.  17920.
1S    0.    172.    184.    202.    220.    236.    263.    274.    293.    307.
1S  326.    345.    364.    383.    401.    420.    438.
1E 685.7   698.2   699.2   700.2   701.2   702.2   703.6   704.2   705.2    706.
1E  707.    708.    709.    710.    711.    712.    713.
1$ 698.2
1D 707.3
1B   90.       1   685.7       1   698.2   707.3
1B  100.      .5   685.7       1   698.2   730.0
K      1      A3                               1       1
K1 CHANNEL ROUTING  MOD PULS  FIRST ROAD CROSSING
Y                              1       1
Y1     1                                               1
Y6  .070    .050    .070    650.    680.   1500.  0.0238
Y7    0.    680.      5.    660.     16.    656.     17.    650.     34.    650.
Y7   35.    656.     40.    660.     50.    680.
K      1      A4                               1       1
K1 CHANNEL ROUTING  MOD PULS  VALLEY
Y                              1       1
Y1     1                                               1
Y6  .079    .050    .070    640.    680.   1000.  0.0100
Y7    0.    680.     10.    660.     47.    641.     48.    640.     52.    680.
Y7   53.    681.     90.    660.    120.    680.
K      1      A5                               1       1
K1 CHANNEL ROUTING  MOD PULS  SECOND ROAD CROSSING
Y                              1       1
Y1     1                                               1
Y6  .070    .050    .070    540.    560.   5000.  0.0105
Y7    0.    560.     10.    560.     12.    567.     13.    540.     37.    560.
```

```
Y7    38.     587.     40.     560.     50.     500.
K       1       A7                               1       1
K1 CHANNEL ROUTING  MOD PULS  THIRD ROAD CROSSING
Y                                 1       1
Y1      1                                                 1
Y6   .070     .050     .070     390.     420.     3800.   0.0395
Y7     0.     420.      10.     400.      16.     396.      17.     390.      41.     390.
Y7    42.     396.      50.     400.      90.     420.
K      99
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	A1
ROUTE HYDROGRAPH TO	A2
ROUTE HYDROGRAPH TO	A3
ROUTE HYDROGRAPH TO	A4
ROUTE HYDROGRAPH TO	A5
ROUTE HYDROGRAPH TO	A6
END OF NETWORK	

```
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
 LAST MODIFICATION  26 FEB 79
**********************************

RUN  DATE* 80/02/21.
     TIME* 13.40.21.

          YOUNGS POND DAM OVERTOPPING AND BREACH ANALYSIS *K.STUART*ANDERSON-NICHOLS*
          NEW JERSEY DAM NUMBER 615
          0.2,0.5 AND 1.0 MULTIPLES OF PMF FROM 25.4 INCH PMF

                                 JOB SPECIFICATION
          NO     NHR     NMIN    IDAY     IHR     IMIN    METRC     IPLT     IPRT    NSTAN
         180       0       10       0       0        0        0        0        0        0
                                 JOPER     NWT   LROPT    TRACE
                                     5       0       0        0

                          MULTI-PLAN ANALYSES TO BE PERFORMED
                             NPLAN= 2 NRTIO= 3 LRTIO= 1
           RTIOS=    .20     .50    1.00

**********          **********          **********          **********          **********

                             SUB-AREA RUNOFF COMPUTATION

      YOUNGS POND INFLOW HYDROGRAPH

                  ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                     A1        0        0        0        0        0        1        0        0

                                   HYDROGRAPH DATA
         IHYDG    IUHG   TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
             1       2    4.50     0.00     4.50      .80    0.000        0        1        0

                                    PRECIP DATA
                     SPFE     PMS      R6      R12      R24      R48      R72      R96
                     0.00   25.40  113.00   123.00   132.00     0.00     0.00     0.00

                                     LOSS DATA
    LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
        0    0.00    0.00    1.00    0.00    0.00    1.00    1.00     .10    0.00    0.00

                               UNIT HYDROGRAPH DATA
                               TC=  0.00     LAG=  1.50

                                   RECESSION DATA
                     STRTQ=    -3.00    QRCSN=    0.00    RTIOR= 1.00

      UNIT HYDROGRAPH 47 END OF PERIOD ORDINATES, TC=   0.00 HOURS, LAG=   1.50  VOL= 1.00
    [illegible]     150.     [illegible]     [illegible]      715.     [illegible]     [illegible]     [illegible]     [illegible]     1367.
   [illegible]     1217.     [illegible]      971.     [illegible]     [illegible]     [illegible]     [illegible]      385.      332.
    [illegible]    [illegible]     [illegible]    [illegible]      141.     [illegible]      [illegible]       84.       70.     [illegible]
    [illegible]     [illegible]     [illegible]    [illegible]     [illegible]       21.       16.       [illegible]       13.       12.
```

	11.	10.	9.	8.	7.	6.	5.	4.	3.	2.	1.				
						END-OF-PERIOD FLOW									
MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q		
1.01	.10	1	.02	0.00	.02	14.	1.01	15.10	91	.52	.51	.02	7027.		
1.01	.20	2	.02	0.00	.02	14.	1.01	15.20	92	.07	.06	.02	7760.		
1.01	.30	3	.02	0.00	.02	14.	1.01	15.30	93	1.57	1.55	.02	7740.		
1.01	.40	4	.02	0.00	.02	14.	1.01	15.40	94	3.93	3.91	.02	8324.		
1.01	.50	5	.02	0.00	.02	14.	1.01	15.50	95	1.13	1.12	.02	9135.		
1.01	1.00	6	.02	0.00	.02	14.	1.01	16.00	96	.70	.68	.02	10130.		
1.01	1.10	7	.02	0.00	.02	14.	1.01	16.10	97	.54	.52	.02	11350.		
1.01	1.20	8	.02	0.00	.02	14.	1.01	16.20	98	.54	.52	.02	12769.		
1.01	1.30	9	.02	0.00	.02	14.	1.01	16.30	99	.54	.52	.02	14192.		
1.01	1.40	10	.02	0.00	.02	14.	1.01	16.40	100	.54	.52	.02	15291.		
1.01	1.50	11	.02	0.00	.02	14.	1.01	16.50	101	.54	.52	.02	16017.		
1.01	2.00	12	.02	0.00	.02	14.	1.01	17.00	102	.54	.52	.02	16329.		
1.01	2.10	13	.02	0.00	.02	14.	1.01	17.10	103	.42	.40	.02	16320.		
1.01	2.20	14	.02	0.00	.02	14.	1.01	17.20	104	.42	.40	.02	16017.		
1.01	2.30	15	.02	0.00	.02	14.	1.01	17.30	105	.42	.40	.02	15400.		
1.01	2.40	16	.02	0.00	.02	14.	1.01	17.40	106	.42	.40	.02	14518.		
1.01	2.50	17	.02	0.00	.02	14.	1.01	17.50	107	.42	.40	.02	13907.		
1.01	3.00	18	.02	0.00	.02	14.	1.01	18.00	108	.42	.40	.02	13033.		
1.01	3.10	19	.02	0.00	.02	14.	1.01	18.10	109	.03	.01	.02	12118.		
1.01	3.20	20	.02	0.00	.02	14.	1.01	18.20	110	.03	.01	.02	11320.		
1.01	3.30	21	.02	0.00	.02	14.	1.01	18.30	111	.03	.01	.02	10570.		
1.01	3.40	22	.02	0.00	.02	14.	1.01	18.40	112	.03	.01	.02	9854.		
1.01	3.50	23	.02	0.00	.02	14.	1.01	18.50	113	.03	.01	.02	9125.		
1.01	4.00	24	.02	0.00	.02	14.	1.01	19.00	114	.03	.01	.02	8331.		
1.01	4.10	25	.02	0.00	.02	14.	1.01	19.10	115	.03	.01	.02	7508.		
1.01	4.20	26	.02	0.00	.02	14.	1.01	19.20	116	.03	.01	.02	6677.		
1.01	4.30	27	.02	0.00	.02	14.	1.01	19.30	117	.03	.01	.02	5889.		
1.01	4.40	28	.02	0.00	.02	14.	1.01	19.40	118	.03	.01	.02	5138.		
1.01	4.50	29	.02	0.00	.02	14.	1.01	19.50	119	.03	.01	.02	4445.		
1.01	5.00	30	.02	0.00	.02	14.	1.01	20.00	120	.03	.01	.02	3814.		
1.01	5.10	31	.02	0.00	.02	14.	1.01	20.10	121	.03	.01	.02	3251.		
1.01	5.20	32	.02	0.00	.02	14.	1.01	20.20	122	.03	.01	.02	2763.		
1.01	5.30	33	.02	0.00	.02	14.	1.01	20.30	123	.03	.01	.02	2357.		
1.01	5.40	34	.02	0.00	.02	14.	1.01	20.40	124	.03	.01	.02	2025.		
1.01	5.50	35	.02	0.00	.02	14.	1.01	20.50	125	.03	.01	.02	1747.		
1.01	6.00	36	.02	0.00	.02	14.	1.01	21.00	126	.03	.01	.02	1514.		
1.01	6.10	37	.06	0.00	.06	14.	1.01	21.10	127	.03	.01	.02	1316.		
1.01	6.20	38	.06	0.00	.06	14.	1.01	21.20	128	.03	.01	.02	1147.		
1.01	6.30	39	.06	0.00	.06	14.	1.01	21.30	129	.03	.01	.02	1004.		
1.01	6.40	40	.06	0.00	.06	14.	1.01	21.40	130	.03	.01	.02	884.		
1.01	6.50	41	.06	.01	.05	14.	1.01	21.50	131	.03	.01	.02	785.		
1.01	7.00	42	.06	.04	.02	17.	1.01	22.00	132	.03	.01	.02	702.		
1.01	7.10	43	.06	.04	.02	24.	1.01	22.10	133	.03	.01	.02	631.		
1.01	7.20	44	.06	.04	.02	37.	1.01	22.20	134	.03	.01	.02	570.		
1.01	7.30	45	.06	.04	.02	58.	1.01	22.30	135	.03	.01	.02	518.		
1.01	7.40	46	.06	.04	.02	89.	1.01	22.40	136	.03	.01	.02	473.		
1.01	7.50	47	.06	.04	.02	130.	1.01	22.50	137	.03	.01	.02	434.		
1.01	8.00	48	.06	.04	.02	179.	1.01	23.00	138	.03	.01	.02	400.		
1.01	8.10	49	.06	.04	.02	231.	1.01	23.10	139	.03	.01	.02	371.		
1.01	8.20	50	.06	.04	.02	286.	1.01	23.20	140	.03	.01	.02	346.		
1.01	8.30	51	.06	.04	.02	340.	1.01	23.30	141	.03	.01	.02	327.		
1.01	8.40	52	.06	.04	.02	391.	1.01	23.40	142	.03	.01	.02	313.		
1.01	8.50	53	.06	.04	.02	438.	1.01	23.50	143	.03	.01	.02	302.		
1.01	9.00	54	.06	.04	.02	481.	1.02	0.00	144	.03	.01	.02	293.		
1.01	9.10	55	.06	.04	.02	518.	1.02	.10	145	0.00	0.00	0.00	285.		

1.01	9.00	56	.06	.04	.02	548.	1.02	.00	146	0.00	0.00	0.00	276.
1.01	9.10	57	.06	.04	.02	577.	1.02	.10	147	0.00	0.00	0.00	266.
1.01	9.20	58	.06	.04	.02	594.	1.02	.20	148	0.00	0.00	0.00	255.
1.01	9.30	59	.06	.04	.02	612.	1.02	.30	149	0.00	0.00	0.00	241.
1.01	10.00	60	.06	.04	.02	627.	1.02	1.40	150	0.00	0.00	0.00	225.
1.01	10.10	61	.06	.04	.02	639.	1.02	1.10	151	0.00	0.00	0.00	206.
1.01	10.20	62	.06	.04	.02	650.	1.02	1.20	152	0.00	0.00	0.00	186.
1.01	10.30	63	.06	.04	.02	659.	1.02	1.30	153	0.00	0.00	0.00	165.
1.01	10.40	64	.06	.04	.02	667.	1.02	1.40	154	0.00	0.00	0.00	146.
1.01	10.50	65	.06	.04	.02	673.	1.02	1.50	155	0.00	0.00	0.00	127.
1.01	11.00	66	.06	.04	.02	678.	1.02	2.00	156	0.00	0.00	0.00	110.
1.01	11.10	67	.06	.04	.02	683.	1.02	2.10	157	0.00	0.00	0.00	95.
1.01	11.20	68	.06	.04	.02	687.	1.02	2.20	158	0.00	0.00	0.00	82.
1.01	11.30	69	.06	.04	.02	690.	1.02	2.30	159	0.00	0.00	0.00	70.
1.01	11.40	70	.06	.04	.02	693.	1.02	2.40	160	0.00	0.00	0.00	61.
1.01	11.50	71	.06	.04	.02	695.	1.02	2.50	161	0.00	0.00	0.00	54.
1.01	12.00	72	.06	.04	.02	697.	1.02	3.00	162	0.00	0.00	0.00	48.
1.01	12.10	73	.30	.37	.02	713.	1.02	3.10	163	0.00	0.00	0.00	42.
1.01	12.20	74	.30	.37	.02	764.	1.02	3.20	164	0.00	0.00	0.00	38.
1.01	12.30	75	.30	.37	.02	850.	1.02	3.30	165	0.00	0.00	0.00	34.
1.01	12.40	76	.30	.37	.02	1014.	1.02	3.40	166	0.00	0.00	0.00	31.
1.01	12.50	77	.30	.37	.02	1248.	1.02	3.50	167	0.00	0.00	0.00	28.
1.01	13.00	78	.30	.37	.02	1567.	1.02	4.00	168	0.00	0.00	0.00	26.
1.01	13.10	79	.46	.44	.02	1957.	1.02	4.10	169	0.00	0.00	0.00	24.
1.01	13.20	80	.46	.44	.02	2397.	1.02	4.20	170	0.00	0.00	0.00	22.
1.01	13.30	81	.46	.44	.02	2866.	1.02	4.30	171	0.00	0.00	0.00	21.
1.01	13.40	82	.46	.44	.02	3340.	1.02	4.40	172	0.00	0.00	0.00	19.
1.01	13.50	83	.46	.44	.02	3832.	1.02	4.50	173	0.00	0.00	0.00	18.
1.01	14.00	84	.46	.44	.02	4304.	1.02	5.00	174	0.00	0.00	0.00	18.
1.01	14.10	85	.57	.56	.02	4761.	1.02	5.10	175	0.00	0.00	0.00	17.
1.01	14.20	86	.57	.56	.02	5195.	1.02	5.20	176	0.00	0.00	0.00	16.
1.01	14.30	87	.57	.56	.02	5596.	1.02	5.30	177	0.00	0.00	0.00	16.
1.01	14.40	88	.57	.56	.02	5968.	1.02	5.40	178	0.00	0.00	0.00	15.
1.01	14.50	89	.57	.56	.02	6324.	1.02	5.50	179	0.00	0.00	0.00	15.
1.01	15.00	90	.57	.56	.02	6683.	1.02	6.00	180	0.00	0.00	0.00	15.
									SUM	26.82	24.10	2.72	422101.
										(681.)	(612.)	(69.)	(11954.)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	16329.	9859.	2928.	2345.	422143.
CMS	462.	279.	83.	66.	11954.
INCHES		20.38	24.21	24.24	24.24
MM		517.64	615.01	615.70	615.70
AC-FT		4889.	5809.	5815.	5815.
HOUR CU M		6030.	7164.	7172.	7172.

HYDROGRAPH AT STA AT FOR PLAN 1, RTIO 2

7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	8.	12.	19.	29.	45.	65.	89.	116.	147.
178.	195.	219.	249.	259.	274.	287.	297.	306.	313.
320.	325.	329.	333.	336.	339.	341.	343.	345.	346.
347.	348.	357.	382.	429.	507.	624.	784.	979.	1199.
1433.	1674.	1916.	2152.	2380.	2598.	2798.	2984.	3164.	3342.
3513.	3684.	3870.	4162.	4567.	5065.	5675.	6384.	7091.	7640.
8006.	8165.	8160.	8008.	7745.	7409.	6993.	6517.	6059.	5660.
5299.	4927.	4562.	4166.	3758.	3338.	2944.	2569.	2222.	1907.
1624.	1381.	1170.	1013.	873.	757.	658.	574.	502.	442.
392.	351.	317.	285.	259.	236.	217.	200.	186.	173.
164.	157.	151.	146.	142.	138.	133.	128.	121.	112.
103.	93.	83.	73.	64.	55.	48.	41.	35.	31.
27.	24.	21.	19.	17.	15.	14.	13.	12.	11.
10.	10.	9.	9.	8.	8.	8.	8.	8.	7.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8165.	49294.	1464.	1173.	211071.
CMS	231.	1404.	41.	33.	5977.
INCHES		10.19	12.11	12.12	12.12
MM		258.82	307.51	307.85	307.85
AC-FT		2444.	2904.	2907.	2907.
THOUS CU M		3015.	3582.	3586.	3586.

HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THROUGH YOUNGS POND

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
A2	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME
ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.0	0.000	0.00	1	1	0	0		0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	172.	-1

STAGE	6[illegible]5.20	699.20	700.20	701.20	702.20	703.20	704.20	705.20	706.00	707.00
	707.30	708.00	709.00	710.00	711.00	712.00	713.00			
FLOW	0.00	1[illegible]0.00	540.00	808.00	840.00	880.00	920.00	952.00	976.00	100[illegible].00
	115[illegible].00	1890.00	3955.00	6755.00	10020.00	13760.00	17920.00			
CAPACITY=	0.	172.	184.	202.	220.	236.	263.	274.	293.	307.
	326.	345.	364.	383.	401.	420.	438.			
ELEVATION=	686.	698.	699.	700.	701.	702.	704.	70[illegible].	705.	706.
	707.	708.	709.	710.	711.	712.	713.			

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
698.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
707.3	0.0	0.0	0.

DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
90.	1.00	685.70	1.00	698.20	707.30

STATION FC, PLAN 1, RATIO 2

[illegible] AT 10.47 HOURS

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1.	2.	3.	4.	4.	5.	5.	6.	6.	6.
6.	6.	6.	6.	6.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	8.	9.	12.	17.	24.	35.	48.	64.
83.	102.	123.	144.	165.	185.	206.	226.	244.	260.
277.	295.	295.	303.	311.	317.	323.	327.	331.	335.
341.	348.	347.	349.	363.	387.	429.	494.	576.	671.
791.	926.	1053.	1196.	1325.	1461.	1662.	1988.	4150.	5053.
7257.	7808.	7317.	7563.	5298.	4937.	5219.	5944.	6540.	7202.
7711.	8019.	8139.	8093.	7914.	7637.	7283.	6859.	6407.	5981.
5553.	5227.	4959.	4581.	4114.	3718.	3320.	2950.	2595.	2266.
1966.	1699.	1466.	1268.	1100.	958.	838.	735.	647.	571.
507.	452.	406.	365.	331.	301.	275.	252.	232.	215.
200.	188.	177.	169.	161.	155.	149.	144.	138.	132.
125.	118.	110.	101.	93.	88.	76.	69.	62.	55.
50.	45.	40.	36.	33.	30.	27.	25.	23.	21.
19.	18.	17.	15.	14.	14.	13.	12.	12.	11.

STORAGE

172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	173.	173.	173.	174.	174.	175.	176.
177.	178.	180.	181.	182.	184.	185.	186.	187.	188.
189.	189.	189.	190.	190.	191.	191.	191.	191.	191.
192.	192.	192.	192.	193.	194.	196.	200.	204.	211.
219.	229.	242.	258.	277.	298.	322.	342.	342.	318.
274.	219.	166.	119.	94.	90.	94.	101.	108.	115.
120.	125.	124.	124.	122.	120.	116.	112.	107.	102.
98.	94.	90.	85.	80.	75.	70.	65.	60.	55.
50.	45.	41.	37.	34.	31.	28.	26.	24.	22.
20.	19.	18.	16.	15.	14.	14.	13.	12.	12.
11.	11.	10.	10.	10.	9.	9.	9.	9.	8.
8.	8.	7.	7.	7.	6.	6.	5.	5.	5.
4.	4.	4.	4.	3.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.

STAGE

698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.3	698.3	698.3	698.4	698.5	698.5
698.6	698.7	698.8	698.8	699.1	699.2	699.3	699.4	699.4	699.4
699.4	699.5	699.5	699.5	699.5	699.6	699.6	699.6	699.6	699.6
699.6	699.6	699.6	699.7	699.7	699.8	699.9	700.1	700.3	700.7
701.1	701.8	702.5	703.4	704.4	705.5	706.8	707.8	707.8	707.6
704.2	701.1	697.8	694.5	692.6	692.3	692.5	693.0	693.6	694.1
694.4	694.7	694.7	694.7	694.6	694.4	694.1	693.8	693.5	693.1

692.9	692.5	692.2	691.9	691.5	691.2	690.8	690.4	690.0	689.7
687.3	689.0	688.7	688.4	688.2	688.0	687.8	687.6	687.4	687.3
687.2	687.1	687.0	686.9	686.8	686.7	686.7	686.6	686.6	686.5
686.5	686.5	686.4	686.4	686.4	686.4	686.4	686.3	686.3	686.3
686.2	686.3	686.2	686.2	686.2	686.2	686.1	686.1	686.1	686.0
686.0	686.0	686.0	686.0	685.9	685.9	685.9	685.9	685.9	685.9
685.9	685.9	685.9	685.8	685.8	685.8	685.8	685.8	685.8	685.8

PEAK OUTFLOW IS 8138. AT TIME 17.17 HOURS

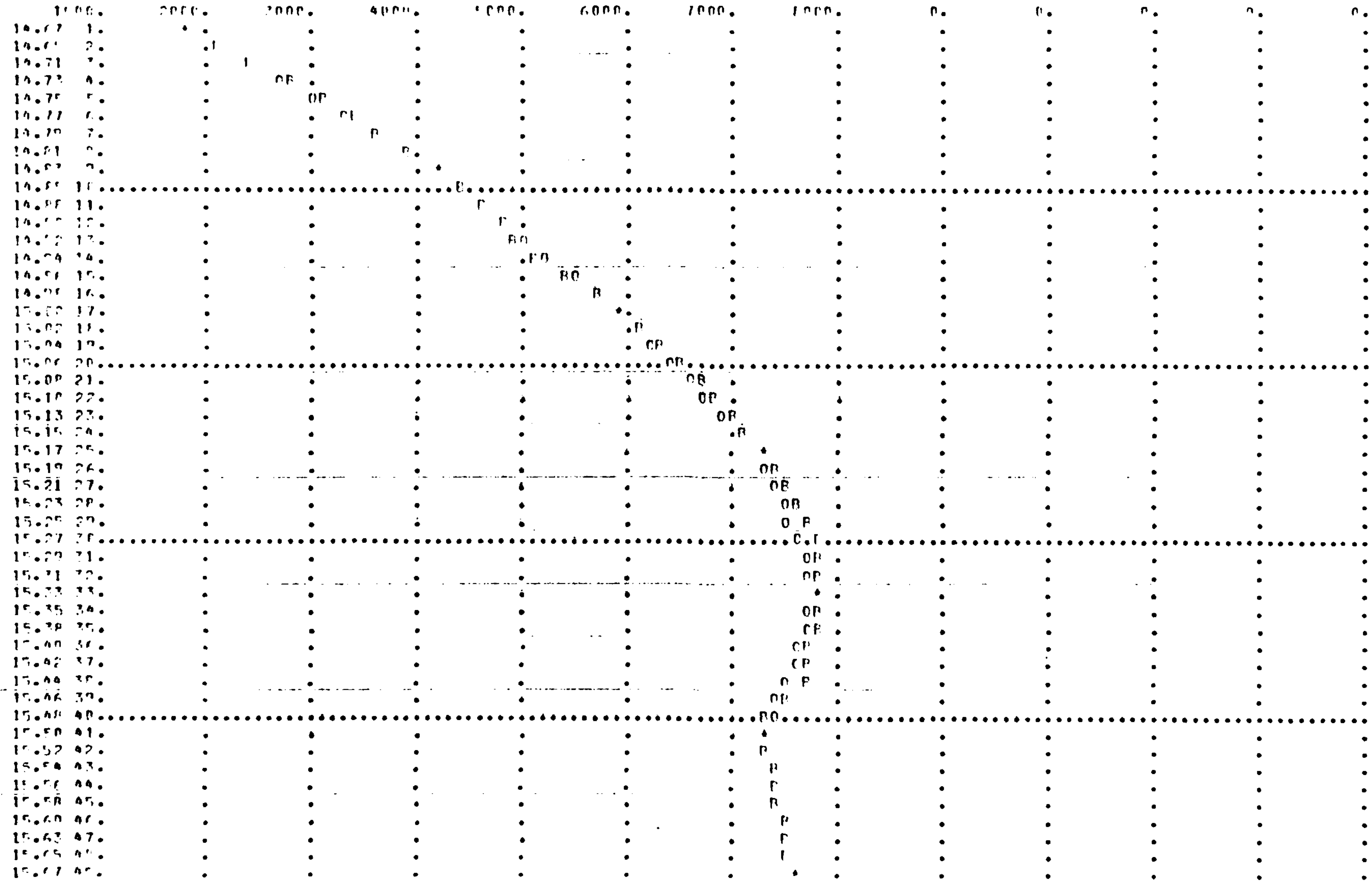
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8138.	5016.	1551.	1242.	223521.
CMS	230.	153.	44.	35.	6329.
INCHES		11.20	12.82	12.83	12.83
MM		284.39	325.70	326.01	326.01
AC-FT		26864	3076.	3079.	3079.
THOUS CU M		3313.	3794.	3798.	3798.

THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF .021 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF .167 HOURS.
THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	- COMPUTED BREACH HYDROGRAPH (CFS)	= ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
14.667	0.000	1808.	1808.	0.	0.	0.
14.688	.021	2101.	2110.	-9.	-9.	-0.
14.708	.042	2394.	2434.	-40.	-49.	-0.
14.729	.063	2686.	2781.	-94.	-144.	-0.
14.750	.083	2979.	3104.	-125.	-268.	-0.
14.771	.104	3272.	3386.	-115.	-383.	-1.
14.792	.125	3565.	3648.	-83.	-466.	-1.
14.813	.146	3857.	3910.	-52.	-518.	-1.
14.833	.167	4150.	4150.	0.	-518.	-1.
14.854	.188	4368.	4370.	-2.	-520.	-1.
14.875	.208	4586.	4569.	17.	-503.	-1.
14.896	.229	4804.	4750.	54.	-450.	-1.
14.917	.250	5022.	4914.	108.	-342.	-1.
14.938	.271	5240.	5141.	98.	-243.	-0.
14.958	.292	5457.	5400.	57.	-186.	-0.
14.979	.313	5675.	5655.	20.	-166.	-0.
15.000	.333	5893.	5893.	0.	-166.	-0.
15.021	.354	6064.	6112.	-48.	-214.	-0.
15.042	.375	6234.	6313.	-79.	-294.	-1.
15.063	.396	6405.	6493.	-89.	-382.	-1.
15.083	.417	6575.	6655.	-80.	-462.	-1.
15.104	.438	6746.	6804.	-58.	-520.	-1.
15.125	.458	6916.	6969.	-53.	-572.	-1.
15.146	.479	7087.	7120.	-33.	-605.	-1.
15.167	.500	7257.	7257.	0.	-605.	-1.
15.188	.521	7325.	7365.	-40.	-645.	-1.
15.208	.542	7393.	7470.	-77.	-722.	-1.
15.229	.563	7461.	7582.	-121.	-844.	-1.
15.250	.583	7529.	7685.	-156.	-1000.	-2.
15.271	.604	7597.	7779.	-182.	-1182.	-2.
15.292	.625	7664.	7824.	-160.	-1342.	-2.
15.313	.646	7732.	7812.	-80.	-1422.	-2.
15.333	.667	7800.	7800.	0.	-1422.	-2.
15.354	.688	7740.	7774.	-34.	-1456.	-3.
15.375	.708	7679.	7755.	-76.	-1532.	-3.
15.396	.729	7619.	7725.	-106.	-1638.	-3.
15.417	.750	7558.	7692.	-134.	-1772.	-3.
15.438	.771	7498.	7669.	-171.	-1943.	-3.
15.458	.792	7437.	7456.	-19.	-1962.	-3.
15.479	.812	7377.	7290.	87.	-1875.	-3.
15.500	.833	7317.	7317.	0.	-1875.	-3.
15.521	.854	7347.	7344.	4.	-1871.	-3.
15.542	.875	7377.	7372.	6.	-1865.	-3.
15.563	.896	7402.	7402.	1.	-1858.	-3.
15.583	.917	7440.	7432.	7.	-1851.	-3.
15.604	.937	7470.	7464.	6.	-1844.	-3.
15.625	.958	7501.	7496.	5.	-1839.	-3.
15.646	.979	7532.	7528.	3.	-1837.	-3.
15.667	1.000	7562.	7562.	0.	-1837.	-3.

STATION A2

TIME (HRS) — (O) INTERPOLATED BREACH HYDROGRAPH; (B) COMPUTED BREACH HYDROGRAPH; (*) POINTS AT NORMAL TIME INTERVAL



STATION A2, PLAN 2, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1.	2.	3.	4.	4.	5.	5.	6.	6.	6.
6.	6.	6.	6.	6.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	8.	9.	12.	17.	24.	35.	48.	64.
82.	102.	123.	144.	165.	185.	206.	226.	244.	260.
277.	285.	295.	303.	311.	317.	323.	327.	331.	335.
338.	340.	343.	349.	363.	387.	429.	494.	576.	671.
771.	876.	853.	886.	925.	961.	1062.	1732.	2795.	3187.
3393.	3569.	3749.	3984.	4367.	4819.	5374.	6035.	6743.	7438.
7871.	8109.	8168.	8075.	7855.	7546.	7163.	6714.	6285.	5857.
5472.	5106.	4742.	4361.	3957.	3605.	3208.	2822.	2457.	2121.
1843.	1655.	1447.	1252.	1133.	1088.	1058.	1024.	986.	967.
956.	941.	927.	910.	892.	873.	855.	837.	820.	769.
697.	564.	474.	397.	338.	291.	254.	225.	201.	183.
167.	154.	141.	129.	117.	105.	95.	85.	76.	67.
60.	53.	47.	42.	37.	33.	29.	26.	24.	21.
19.	17.	16.	14.	13.	12.	11.	11.	10.	10.

STORAGE

172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	173.	173.	173.	174.	174.	175.	176.
177.	178.	180.	181.	182.	184.	185.	186.	187.	188.
188.	189.	189.	190.	190.	191.	191.	191.	191.	191.
192.	192.	192.	192.	193.	194.	196.	200.	204.	211.
221.	232.	242.	252.	262.	272.	282.	342.	353.	357.
360.	360.	360.	364.	367.	370.	374.	378.	383.	387.
390.	391.	391.	390.	391.	392.	395.	393.	396.	397.
396.	396.	396.	397.	398.	399.	397.	394.	390.	387.

344.	341.	337.	334.	330.	326.	321.	315.	309.	302.
294.	286.	278.	270.	261.	252.	243.	235.	226.	217.
210.	204.	199.	195.	192.	189.	187.	186.	185.	184.
183.	182.	181.	180.	179.	179.	178.	177.	177.	176.
176.	175.	175.	175.	174.	174.	174.	174.	173.	173.
173.	173.	173.	173.	173.	173.	173.	173.	173.	173.

STAGE

698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2	698.2
698.2	698.2	698.2	698.2	698.2	698.3	698.3	698.4	698.5	698.5
698.6	698.7	698.8	699.0	699.1	699.2	699.2	699.3	699.4	699.4
699.4	699.5	699.5	699.5	699.5	699.6	699.6	699.6	699.6	699.6
699.6	699.6	699.6	699.7	699.7	699.8	699.9	700.1	700.3	700.7
701.1	701.8	702.5	703.4	704.4	705.5	706.8	707.9	708.4	708.6
708.7	708.8	708.9	709.0	709.1	709.3	709.5	709.7	710.0	710.2
710.3	710.4	710.4	710.4	710.3	710.2	710.1	710.0	709.8	709.7
709.5	709.4	709.3	709.1	709.0	708.8	708.6	708.5	708.3	708.1
708.0	707.8	707.6	707.4	707.2	707.0	706.7	706.4	706.1	705.7
705.3	704.8	704.4	704.0	703.5	703.0	702.6	702.1	701.6	701.1
700.6	700.3	700.0	699.8	699.6	699.5	699.4	699.3	699.2	699.2
699.1	699.0	698.9	698.9	698.8	698.8	698.7	698.6	698.6	698.6
698.5	698.5	698.4	698.4	698.4	698.4	698.4	698.3	698.3	698.3
698.3	698.3	698.3	698.3	698.3	698.3	698.3	698.3	698.3	698.3

PEAK OUTFLOW IS 816. AT TIME 17.17 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	816.	4818.	1464.	1172.	211037.
CMS	231.	136.	41.	33.	5976.
INCHES		9.96	12.11	12.12	12.12
MM		252.95	307.49	307.80	307.80
AC-FT		2389.	2904.	2907.	2907.
THOUS CU M		2947.	3582.	3586.	3586.

HYDROGRAPH ROUTING

CHANNEL ROUTING FOR FULL FIRST ROAD CROSSING

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
AT	1	0	0	0	1	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IHYD	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	1.	0

NORMAL DEPTH CHANNEL ROUTING

QQ(1)	QQ(2)	QQ(3)	ELNVT	ELMAX	RLNTH	SEL
.0700	.0500	.0700	650.0	680.0	1500.	.02380

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 680.00 5.00 660.00 16.00 656.00 17.00 650.00 34.00 650.00
35.00 656.00 40.00 660.00 50.00 680.00

STORAGE	0.00	.94	1.91	2.90	3.93	5.21	6.82	8.72	10.70	12.74
	14.85	17.02	19.26	21.56	23.92	26.35	28.84	31.40	34.02	36.71
OUTFLOW	0.00	153.01	451.65	835.52	1300.64	1940.56	2737.19	3723.77	4867.63	6145.71
	7550.13	9076.09	10720.47	12481.17	14356.77	16346.33	18449.23	20665.11	22993.78	25435.22
STAGE	650.00	651.58	653.16	654.74	656.32	657.89	659.47	661.05	662.63	664.21
	665.79	667.37	668.95	670.53	672.11	673.68	675.26	676.84	678.42	680.00
FLOW	0.00	153.01	451.65	835.52	1300.64	1940.56	2737.19	3723.77	4867.63	6145.71
	7550.13	9076.09	10720.47	12481.17	14356.77	16346.33	18449.23	20665.11	22993.78	25435.22

STATION A3, PLAN 1, RTIO 2

OUTFLOW

0.	2.	3.	4.	4.	5.	5.	5.	6.	6.
6.	6.	6.	6.	6.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	8.	11.	15.	21.	30.	42.	57.
78.	93.	113.	139.	156.	181.	200.	222.	240.	256.
270.	285.	292.	301.	309.	316.	321.	326.	330.	334.
337.	339.	342.	347.	359.	391.	418.	479.	560.	652.
767.	828.	846.	882.	918.	956.	1040.	1646.	3718.	5816.
7050.	7833.	7370.	7470.	5754.	4715.	5339.	5687.	6511.	7102.
7585.	7983.	8141.	8099.	7941.	7667.	7326.	6907.	6457.	6026.
5638.	5268.	4911.	4549.	4163.	3760.	3382.	3000.	2645.	2313.
2009.	1736.	1498.	1295.	1127.	979.	857.	754.	663.	585.
518.	462.	416.	374.	339.	308.	281.	257.	237.	219.
203.	190.	179.	170.	163.	156.	151.	146.	141.	135.
128.	121.	113.	105.	97.	88.	80.	72.	65.	58.
52.	47.	42.	38.	34.	31.	28.	26.	24.	22.
20.	18.	17.	16.	15.	14.	13.	12.	12.	11.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
3.	3.	3.	3.	3.	3.	3.	5.	9.	12.
14.	15.	15.	15.	12.	10.	11.	12.	13.	14.
15.	15.	16.	16.	15.	15.	15.	14.	13.	13.
12.	11.	11.	10.	9.	9.	8.	7.	7.	6.
5.	5.	4.	4.	4.	3.	3.	3.	2.	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

650.0	650.0	650.0	650.0	650.0	650.0	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.2	650.2	650.3	650.4	650.6
650.8	651.0	651.2	651.4	651.6	651.7	651.8	651.9	652.0	652.1
652.2	652.3	652.3	652.4	652.4	652.4	652.5	652.5	652.5	652.5
652.6	652.6	652.6	652.6	652.7	652.8	653.0	653.3	653.6	654.0
654.5	654.7	654.8	654.9	655.0	655.1	655.4	657.2	661.0	663.0
665.2	666.1	665.6	665.7	663.7	662.4	663.2	663.6	664.6	665.3
665.9	666.2	666.4	666.4	666.2	665.9	665.5	665.1	664.8	664.1
663.6	663.1	662.7	662.2	661.7	661.1	660.5	659.9	659.3	658.6
658.0	657.4	656.8	656.3	655.7	655.2	654.8	654.4	654.0	653.7
653.4	653.2	653.0	652.7	652.6	652.4	652.3	652.1	652.0	651.9
651.8	651.8	651.7	651.7	651.6	651.6	651.6	651.5	651.5	651.4
651.3	651.2	651.2	651.1	651.0	650.9	650.8	650.7	650.7	650.6
650.5	650.5	650.4	650.4	650.4	650.3	650.3	650.3	650.2	650.2
650.2	650.2	650.2	650.2	650.2	650.1	650.1	650.1	650.1	650.1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8141.	5416.	1551.	1242.	223516.
CMS	231.	153.	44.	35.	6329.
INCHES		11.20	12.82	12.83	12.83
MM		284.37	325.70	326.00	326.00
AC-FT		2686.	3076.	3079.	3079.
THOUS CU M		3313.	3794.	3798.	3798.

MAXIMUM STORAGE = 16.

MAXIMUM STAGE IS 666.4

STATION A36 PLAN 2A RTIO 2

OUTFLOW

0.	2.	3.	4.	4.	5.	5.	5.	6.	6.
6.	6.	6.	6.	6.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	8.	11.	15.	21.	30.	42.	57.
78.	93.	117.	174.	156.	191.	200.	222.	241.	256.
271.	282.	292.	301.	309.	316.	321.	326.	330.	334.
337.	339.	342.	347.	354.	371.	417.	479.	560.	652.
727.	828.	946.	882.	918.	956.	1040.	1587.	2633.	3391.
3946.	3997.	3717.	3956.	4307.	4765.	5302.	5955.	6665.	7364.
7888.	8086.	8173.	8087.	7864.	7580.	7210.	6765.	6328.	5907.
5517.	5149.	4785.	4412.	4007.	3647.	3271.	2871.	2512.	2168.
1851.	1676.	1512.	1277.	1148.	1051.	1065.	1029.	993.	958.
927.	903.	880.	813.	855.	876.	858.	840.	823.	791.
685.	578.	472.	413.	351.	301.	262.	231.	206.	187.
171.	157.	146.	134.	122.	110.	100.	89.	80.	71.
63.	56.	50.	44.	39.	35.	31.	28.	25.	22.
20.	18.	16.	15.	14.	13.	12.	11.	10.	10.

STOP

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
3.	3.	3.	3.	3.	3.	3.	5.	7.	8.
8.	8.	9.	9.	10.	11.	11.	12.	14.	15.
15.	16.	17.	16.	15.	15.	14.	14.	13.	12.
12.	11.	11.	10.	9.	9.	8.	7.	6.	6.
5.	5.	4.	4.	4.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

650.0	650.0	650.0	650.0	650.0	650.0	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1	650.1
650.1	650.1	650.1	650.1	650.1	650.2	650.2	650.3	650.4	650.6
650.8	651.0	651.2	651.4	651.6	651.7	651.8	651.9	652.0	652.1
652.2	652.3	652.3	652.4	652.4	652.4	652.5	652.5	652.5	652.5
652.6	652.6	652.6	652.6	652.7	652.8	653.0	653.3	653.6	654.0
654.5	654.7	654.8	654.9	655.0	655.1	655.4	657.0	659.3	660.2
660.4	660.8	661.0	661.4	661.9	662.5	663.2	664.0	664.8	665.6
666.1	666.3	666.4	666.3	666.1	665.8	665.4	664.9	664.4	663.9
663.4	663.0	662.5	662.0	661.4	660.9	660.3	659.7	659.0	658.3
657.7	657.2	656.8	656.2	655.8	655.6	655.5	655.4	655.3	655.2
655.1	655.1	655.1	655.0	654.9	654.9	654.8	654.8	654.7	654.5
654.1	653.7	653.3	653.0	652.6	652.4	652.2	652.0	651.9	651.8
651.7	651.6	651.5	651.4	651.3	651.1	651.0	650.9	650.8	650.7
650.7	650.6	650.5	650.5	650.4	650.4	650.3	650.3	650.3	650.2
650.2	650.2	650.2	650.2	650.1	650.1	650.1	650.1	650.1	650.1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8177.	4817.	1464.	1172.	211033.
CMS	231.	136.	41.	33.	5976.
INCHES		9.96	12.11	12.12	12.12
MM		252.95	307.49	307.79	307.79
AC-FT		2388.	2908.	2907.	2907.
THOUS CU M		2947.	3588.	3585.	3585.

MAXIMUM STORAGE = 16.

HYDROGRAPH ROUTING

CHANNEL ROUTING MOD PULS VALLEY

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
44	1	0	10	0	1	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	ICMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	1.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0700	.0500	.0700	640.0	680.0	1000.	.01000

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 680.00 10.00 660.00 47.00 641.00 80.00 660.00 92.00 680.00
92.00 681.00 90.00 660.00 100.00 660.00

STORAGE 0.00 .32 1.02 2.11 3.66 5.80 7.77 11.00 13.52 16.29

	29.97	29.98	29.17	33.65	38.33	43.21	48.20	53.58	58.99	64.78
OUTFLOW	0.00	52.58	222.54	546.42	1059.07	1792.54	2776.72	4039.87	5608.90	7519.57
	9830.48	12555.47	15605.71	18927.32	22583.01	26556.57	30852.52	35475.99	40432.48	45727.79
STOR	640.00	642.11	644.21	646.32	648.42	650.53	652.63	654.74	656.84	658.95
	661.05	663.16	665.26	667.37	669.47	671.58	673.68	675.79	677.89	680.00
FLOW	0.00	52.58	222.54	546.42	1059.07	1792.54	2776.72	4039.87	5608.90	7519.57
	9830.48	12555.47	15605.71	18927.32	22583.01	26556.57	30852.52	35475.99	40432.48	45727.79

STATION A4, PLAN 1, RTIO 2

OUTFLOW

0.	1.	3.	3.	4.	5.	5.	5.	6.	6.
6.	6.	6.	6.	6.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	8.	10.	13.	18.	26.	37.	50.
67.	87.	107.	128.	149.	173.	195.	215.	236.	252.
267.	279.	290.	299.	307.	314.	320.	325.	329.	333.
336.	339.	341.	346.	356.	375.	408.	463.	539.	633.
741.	820.	843.	872.	911.	947.	1019.	1490.	3277.	5584.
6933.	7749.	7519.	7376.	6174.	4702.	5204.	5682.	6341.	7077.
7579.	7991.	8106.	8128.	7954.	7713.	7367.	6971.	6514.	6004.
5686.	5322.	4960.	4602.	4219.	3828.	3441.	3059.	2699.	2370.
2057.	1781.	1542.	1330.	1157.	1008.	881.	774.	681.	600.
527.	476.	427.	385.	347.	315.	287.	263.	242.	223.
208.	194.	183.	173.	165.	158.	153.	148.	142.	137.
130.	123.	116.	107.	99.	91.	82.	74.	67.	60.
54.	49.	44.	40.	36.	33.	30.	27.	25.	22.
21.	19.	18.	16.	15.	14.	13.	13.	12.	11.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	2.
2.	3.	4.	5.	7.	9.	3.	5.	9.	13.

16.	17.	17.	17.	15.	12.	13.	14.	15.	16.
17.	18.	18.	18.	18.	17.	17.	16.	15.	14.
14.	13.	12.	12.	11.	10.	9.	8.	8.	7.
6.	5.	5.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

640.0	640.0	640.1	640.1	640.2	640.2	640.2	640.2	640.2	640.2
640.2	640.2	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3
640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3
640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3
640.3	640.3	640.3	640.3	640.4	640.5	640.7	641.0	641.5	642.0
642.3	642.5	642.8	643.0	643.3	643.6	643.9	644.1	644.3	644.4
644.5	644.6	644.6	644.7	644.8	644.8	644.8	644.9	644.9	644.9
644.9	645.0	645.0	645.0	645.1	645.2	645.4	645.8	646.3	646.7
647.1	647.4	647.5	647.7	647.8	648.0	648.3	649.7	653.5	656.8
658.3	659.2	659.8	659.8	659.5	659.6	656.3	656.9	657.7	658.5
659.0	659.4	659.5	659.5	659.3	659.1	658.8	658.4	657.8	657.4
656.9	656.5	656.0	655.5	655.0	654.4	653.7	653.1	652.5	651.8
651.1	650.5	649.8	649.2	648.7	648.2	647.7	647.3	646.9	646.5
646.2	645.9	645.5	645.3	645.0	644.8	644.6	644.5	644.3	644.2
644.0	643.9	643.7	643.6	643.5	643.4	643.3	643.3	643.2	643.1
643.1	643.0	642.9	642.8	642.7	642.6	642.5	642.4	642.3	642.2
642.1	642.0	641.8	641.6	641.4	641.3	641.2	641.1	641.0	640.9
640.8	640.8	640.7	640.7	640.6	640.6	640.5	640.5	640.5	640.5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8128.	5417.	1551.	1242.	223511.
CMS	230.	153.	44.	35.	6329.
INCHES		11.20	12.82	12.83	12.83
MM		284.41	325.69	325.99	325.99
AC-FT		2686.	3076.	3079.	3079.
THOUS CU M		3313.	3794.	3797.	3797.

MAXIMUM STORAGE = 18.

MAXIMUM STAGE IS 659.5

STATION A4, PLAN 2, RTIO 2

OUTFLOW

0.	1.	3.	3.	4.	5.	5.	5.	6.	6.
6.	6.	6.	6.	6.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	8.	10.	13.	18.	26.	37.	50.
69.	87.	107.	128.	149.	173.	195.	215.	236.	252.
267.	279.	290.	299.	307.	314.	320.	325.	329.	333.
336.	339.	341.	346.	356.	375.	408.	463.	539.	633.
741.	820.	843.	872.	911.	947.	1019.	1447.	2430.	3160.
3326.	3518.	3700.	3908.	4253.	4693.	5223.	5858.	6573.	7271.
7803.	8064.	8170.	8106.	7912.	7622.	7261.	6828.	6304.	5964.
5563.	5202.	4836.	4466.	4067.	3700.	3332.	2933.	2568.	2226.
1924.	1709.	1520.	1316.	1166.	1099.	1068.	1038.	1000.	972.
958.	946.	932.	917.	899.	880.	862.	844.	826.	792.
707.	599.	511.	432.	365.	313.	271.	239.	213.	192.
175.	161.	149.	138.	126.	114.	103.	92.	82.	74.
65.	58.	52.	47.	41.	37.	33.	29.	26.	23.
21.	19.	17.	16.	14.	13.	12.	11.	11.	10.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	2.
2.	3.	3.	3.	3.	3.	5.	7.	9.	9.
9.	9.	10.	10.	11.	12.	13.	14.	15.	17.
17.	18.	18.	18.	18.	17.	17.	16.	15.	14.
13.	13.	12.	11.	10.	10.	9.	8.	7.	6.
6.	5.	5.	4.	4.	4.	4.	4.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

640.0	640.0	640.1	640.1	640.2	640.2	640.2	640.2	640.2	640.2
640.2	640.2	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3
640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3
640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3	640.3
640.3	640.3	640.3	640.3	640.4	640.5	640.7	641.0	641.5	642.0
642.3	642.5	642.8	643.0	643.3	643.6	643.9	644.1	644.3	644.4
644.5	644.6	644.6	644.7	644.8	644.8	644.8	644.9	644.9	644.9
644.9	645.0	645.0	645.0	645.1	645.2	645.4	645.8	646.3	646.7
647.1	647.4	647.5	647.7	647.8	648.0	648.3	649.5	651.9	653.3
653.5	653.9	654.2	654.5	655.0	655.6	656.3	657.1	657.9	658.7
659.2	659.4	659.5	659.5	659.3	659.0	658.7	658.2	657.7	657.2
656.8	656.3	655.8	655.3	654.8	654.2	653.6	652.9	652.2	651.5
650.8	650.3	649.7	649.2	648.7	648.5	648.4	648.3	648.2	648.1
648.0	648.0	647.9	647.8	647.8	647.7	647.6	647.5	647.5	647.3
647.0	646.5	646.1	645.6	645.1	644.8	644.5	644.3	644.1	643.8
643.6	643.5	643.3	643.2	643.0	642.9	642.7	642.6	642.5	642.4
642.3	642.2	642.1	641.9	641.7	641.5	641.3	641.2	641.0	640.9
640.8	640.8	640.7	640.6	640.6	640.5	640.5	640.5	640.4	640.4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8170.	4810.	1464.	1172.	211028.
CMS	231.	136.	41.	33.	5976.
INCHES		9.96	12.11	12.12	12.12
MM		252.98	307.49	307.79	307.79
AC-FT		2389.	2904.	2907.	2907.
THOUS CU M		2947.	3582.	3585.	3585.

MAXIMUM STORAGE = 18.

MAXIMUM STAGE IS 659.5

CHANNEL ROUTING FOR RULE SLEEPER ROAD CROSSING

ISTAO	ICOPT	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
AS	1	0	0	0	1	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	ICPT	IEMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTPL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	1.	0

FORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELMVT	ELMAX	RLNTH	SEL
.0700	.0500	.0700	540.0	580.0	5400.	.01850

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 580.00 10.00 560.00 12.00 547.00 13.00 540.00 37.00 540.00
38.00 547.00 40.00 560.00 50.00 580.00

STORAGE	0.00	6.34	12.84	19.50	26.31	33.30	40.45	47.77	55.26	62.92
	70.80	79.18	88.11	97.59	107.61	118.19	129.32	140.59	153.22	165.99
OUTFLOW	0.00	308.06	909.18	1680.08	2695.33	3954.70	5403.00	7030.30	8828.04	10792.36
	12917.14	15212.02	17681.11	20327.32	23153.82	26163.90	29360.85	32747.96	36328.50	40105.69
STAGE	540.00	542.11	544.21	546.32	548.42	550.53	552.63	554.74	556.84	558.95
	561.05	563.16	565.26	567.37	569.47	571.58	573.68	575.79	577.89	580.00
FLOW	0.00	308.06	909.18	1680.08	2695.33	3954.70	5403.00	7030.30	8828.04	10792.36
	12917.14	15212.02	17681.11	20327.32	23153.82	26163.90	29360.85	32747.96	36328.50	40105.69

STATION A5, PLAN 1, RTIO 2

OUTFLOW

24.	12.	7.	5.	4.	4.	5.	5.	5.	5.
6.	6.	6.	6.	6.	6.	6.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	8.	10.	13.	17.	24.	34.
47.	62.	80.	99.	119.	140.	162.	184.	205.	225.
242.	258.	271.	283.	293.	302.	310.	320.	326.	330.
334.	337.	339.	343.	349.	362.	385.	424.	484.	564.
660.	754.	814.	848.	882.	920.	976.	1223.	2333.	4657.
6565.	7518.	7662.	7395.	6635.	5195.	4913.	5535.	6111.	6034.
7444.	7869.	8092.	8123.	8021.	7787.	7479.	7093.	6667.	6222.
5814.	5439.	5091.	4730.	4358.	3969.	3598.	3212.	2843.	2518.
2210.	1915.	1661.	1461.	1268.	1103.	962.	851.	755.	666.
589.	523.	467.	419.	378.	341.	310.	292.	272.	252.
234.	217.	203.	190.	180.	171.	163.	157.	151.	145.
139.	133.	126.	119.	111.	103.	95.	87.	79.	71.
64.	58.	52.	47.	43.	38.	35.	31.	29.	26.
24.	22.	20.	19.	17.	16.	15.	14.	13.	12.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	2.	2.	2.	3.	3.	4.	4.	5.
5.	5.	6.	6.	6.	6.	6.	6.	7.	7.
7.	7.	7.	7.	7.	7.	7.	8.	8.	9.
10.	11.	12.	12.	13.	13.	13.	16.	24.	37.
46.	50.	50.	49.	46.	39.	38.	41.	44.	47.
49.	51.	52.	52.	52.	51.	50.	48.	46.	44.
42.	41.	39.	37.	35.	33.	31.	29.	27.	25.
23.	21.	19.	18.	16.	15.	13.	12.	11.	10.
9.	9.	8.	8.	7.	7.	6.	6.	6.	5.
5.	4.	4.	4.	4.	4.	3.	3.	3.	3.
3.	3.	3.	2.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

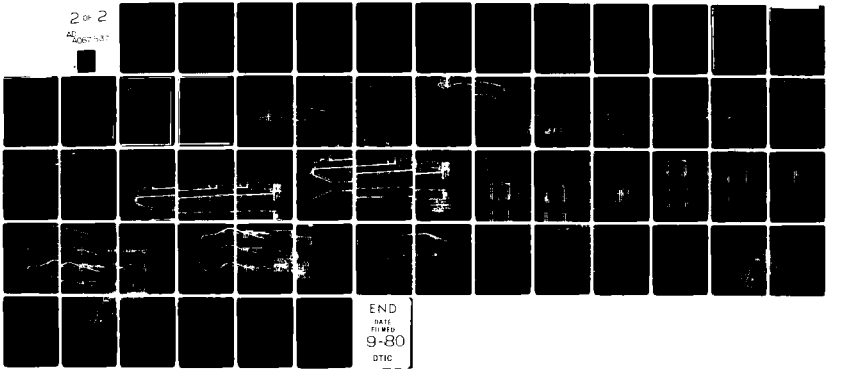
STAGE

540.2	540.1	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.1	540.1	540.1	540.1	540.2	540.2
540.3	540.4	540.5	540.7	540.8	541.0	541.1	541.3	541.4	541.5
541.7	541.8	541.9	541.9	542.0	542.1	542.1	542.1	542.2	542.2
542.2	542.2	542.2	542.2	542.2	542.3	542.4	542.5	542.7	543.0
543.3	543.7	543.9	544.0	544.1	544.2	544.4	545.1	547.7	551.5
554.1	555.3	555.5	555.2	554.2	552.3	551.9	552.8	553.5	554.5
555.2	555.7	556.0	556.0	555.9	555.6	555.3	554.8	554.3	553.7
553.2	552.7	552.2	551.7	551.1	550.5	549.9	549.3	548.7	548.1
547.4	546.8	546.3	545.7	545.2	544.7	544.4	544.0	543.7	543.4
543.1	542.9	542.7	542.5	542.3	542.2	542.1	542.0	541.9	541.7
541.6	541.5	541.4	541.3	541.2	541.2	541.1	541.1	541.0	541.0
541.0	540.9	540.9	540.8	540.8	540.7	540.6	540.6	540.5	540.5
540.4	540.4	540.4	540.3	540.3	540.3	540.2	540.2	540.2	540.2
540.2	540.1	540.1	540.1	540.1	540.1	540.1	540.1	540.1	540.1

AD-A087 537 NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON F/G 13/13
NATIONAL DAM SAFETY PROGRAM. YOUNGS POND DAM (NJ00270) DELAWARE--ETC(U)
FEB 80 W A GUINAN DACW61-79-C-0011

UNCLASSIFIED NL

2 OF 2
AD A087 537



END
DATE FILMED
9-80
DTIC

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8123.	5413.	1551.	1242.	22362P.
CMS	230.	153.	44.	35.	6330.
INCHES		11.19	12.82	12.84	12.84
MM		284.19	325.68	326.02	326.02
AC-FT		26844	3076.	3079.	3079.
THOUS CU M		3311.	3794.	3798.	3798.

MAXIMUM STORAGE = 52.

MAXIMUM STAGE IS 556.68

STATION A5, PLAN 2, RTIO 2

OUTFLOW

24.	12.	7.	5.	4.	4.	5.	5.	5.	5.
6.	6.	6.	6.	6.	6.	6.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	8.	10.	13.	17.	24.	34.
47.	62.	80.	98.	119.	140.	162.	184.	205.	225.
242.	258.	271.	283.	293.	302.	310.	320.	326.	330.
334.	337.	339.	343.	349.	362.	385.	424.	484.	564.
668.	754.	814.	848.	882.	920.	976.	1204.	1881.	2817.
3939.	3976.	4028.	3923.	4117.	4532.	5058.	5633.	6337.	7065.
7698.	8001.	8145.	8136.	7970.	7715.	7374.	6965.	6521.	6099.
5693.	5321.	4969.	4599.	4212.	3835.	3481.	3095.	2713.	2392.
2171.	1813.	1626.	1491.	1263.	1147.	1091.	1057.	1023.	990.
958.	954.	941.	926.	910.	894.	876.	858.	840.	816.
764.	678.	582.	496.	420.	357.	307.	281.	253.	220.
206.	187.	171.	157.	144.	132.	120.	109.	98.	88.
79.	70.	63.	56.	50.	45.	40.	35.	31.	28.
25.	23.	20.	18.	17.	15.	14.	13.	12.	11.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	2.	2.	2.	3.	3.	4.	4.	5.
5.	5.	6.	6.	6.	6.	6.	6.	7.	7.
7.	7.	7.	7.	7.	7.	7.	8.	8.	9.
10.	11.	12.	12.	13.	13.	13.	15.	21.	27.
30.	30.	31.	33.	34.	36.	39.	41.	45.	48.
50.	52.	52.	52.	52.	51.	49.	47.	46.	44.
42.	40.	38.	36.	35.	33.	31.	29.	26.	24.
22.	20.	19.	17.	16.	15.	14.	14.	14.	14.
13.	13.	13.	13.	13.	13.	12.	12.	12.	12.
11.	10.	9.	8.	8.	7.	6.	6.	5.	5.
4.	4.	4.	3.	3.	3.	2.	2.	2.	2.
2.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

540.2	540.1	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0	540.0
540.0	540.0	540.0	540.0	540.1	540.1	540.1	540.1	540.2	540.2
540.3	540.4	540.5	540.7	540.8	541.0	541.1	541.3	541.4	541.5
541.7	541.8	541.9	541.9	542.0	542.1	542.1	542.1	542.2	542.2
542.2	542.2	542.2	542.2	542.2	542.3	542.4	542.5	542.7	543.0
543.3	543.7	543.9	544.0	544.1	544.2	544.4	545.0	546.7	548.6
549.4	549.7	550.0	550.4	550.8	551.4	552.1	552.9	553.8	554.8
555.5	555.9	556.0	556.0	555.8	555.5	555.1	554.7	554.1	553.5
553.0	552.5	552.0	551.5	550.9	550.3	549.7	549.1	548.5	547.8
547.1	546.6	546.2	545.7	545.2	544.9	544.7	544.6	544.5	544.4
544.4	544.3	544.3	544.3	544.2	544.2	544.1	544.0	544.0	543.9
543.7	543.4	543.1	542.8	542.5	542.3	542.1	541.9	541.7	541.6
541.4	541.3	541.2	541.1	541.0	540.9	540.8	540.7	540.7	540.6
540.5	540.5	540.4	540.4	540.3	540.3	540.3	540.2	540.2	540.2
540.2	540.2	540.1	540.1	540.1	540.1	540.1	540.1	540.1	540.1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8145.	4814.	1464.	1172.	211047.
CMS	231.	136.	41.	33.	5976.
INCHES		9.95	12.11	12.12	12.12
MM		252.77	307.48	307.82	307.82
AC-FT		2387.	2904.	2907.	2907.
THOUS CU M		2944.	3582.	3586.	3586.

MAXIMUM STORAGE = 12.

MAXIMUM STAGE IS 556.0

HYDROGRAPH ROUTING

CHANNEL ROUTING MOD PULS THIRD ROAD CROSSING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
AG	1	0	0	0	1	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	1.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELMVT	ELMAX	RLNTH	SEL
.0700	.0500	.0700	390.0	420.0	3800.	.03950

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

	0.00	420.00	10.00	400.00	16.00	396.00	17.00	390.00	41.00	390.00	
	42.00	396.00	50.00	400.00	90.00	420.00					
STORAGE		0.00	3.34	6.76	10.24	13.82	17.93	22.81	28.39	34.58	41.23
		45.46	56.23	68.58	73.41	82.82	92.77	103.20	114.30	125.88	138.01
OUTFLOW		0.00	285.00	855.63	1601.44	2506.56	3704.86	5168.07	6862.68	8848.71	11110.77
		13677.17	16500.72	19648.65	23131.81	26920.30	31024.00	35493.00	40316.84	45505.28	51067.00
STAGE		390.00	391.58	393.16	394.74	396.32	397.90	399.47	401.05	402.63	404.21
		405.79	407.37	408.95	410.53	412.11	413.68	415.26	416.84	418.42	420.00
FLOW		0.00	285.00	855.63	1601.44	2506.56	3704.86	5168.07	6862.68	8848.71	11110.77
		13677.17	16500.72	19648.65	23131.81	26920.30	31024.00	35493.00	40316.84	45505.28	51067.00

STATION A6, PLAN 1, RTIO 2

OUTFLOW

48.	24.	13.	8.	5.	5.	4.	5.	5.	5.
5.	6.	6.	6.	6.	6.	6.	6.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	8.	10.	14.	19.	26.
37.	50.	66.	83.	102.	122.	144.	166.	187.	207.
227.	244.	259.	272.	284.	298.	307.	316.	323.	328.
332.	335.	338.	341.	346.	356.	374.	407.	457.	520.
617.	713.	789.	834.	869.	907.	956.	1127.	1923.	3994.
6176.	7359.	7678.	7472.	6841.	5584.	4866.	5348.	5993.	6644.
7323.	7703.	8056.	8128.	8051.	7948.	7551.	7185.	6766.	6330.
5906.	5526.	5171.	4821.	4449.	4066.	3687.	3311.	2933.	2596.
2297.	1999.	1731.	1520.	1335.	1157.	1009.	887.	794.	705.
622.	551.	491.	440.	396.	357.	323.	299.	282.	267.
249.	232.	216.	202.	189.	179.	170.	162.	156.	150.
144.	138.	132.	125.	118.	110.	102.	93.	85.	78.
70.	63.	57.	52.	47.	42.	38.	34.	31.	28.
26.	24.	22.	20.	18.	17.	16.	15.	14.	13.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	2.	2.	2.	2.
3.	3.	3.	3.	3.	3.	3.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	5.
5.	6.	6.	7.	7.	7.	7.	8.	12.	19.
26.	30.	31.	30.	28.	24.	22.	23.	26.	28.
30.	31.	32.	32.	32.	31.	31.	29.	28.	27.
25.	24.	23.	22.	20.	19.	18.	17.	15.	14.
13.	12.	11.	10.	9.	8.	7.	7.	6.	6.
5.	5.	5.	4.	4.	4.	4.	3.	3.	3.
3.	3.	3.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

[illegible]	390.1	[illegible]	390.0	390.0	390.0	390.0	[illegible]	390.0	390.0
[illegible]	390.0	390.0	390.0	390.0	390.0	390.0	[illegible]	[illegible]	390.1
390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0
390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0
390.0	390.0	390.0	390.0	390.0	390.0	390.1	390.1	390.1	390.1
390.2	390.3	390.4	390.5	390.6	390.7	390.8	390.9	391.0	391.1
391.2	391.4	391.4	391.5	391.6	391.6	391.6	391.7	391.7	391.7
391.7	391.7	391.7	391.7	391.7	391.8	391.8	391.9	392.1	392.3
392.5	392.8	393.0	393.1	393.2	393.3	393.4	393.7	395.3	398.2
400.4	401.4	401.7	401.5	401.0	399.9	399.2	399.7	400.3	400.9
401.4	401.8	402.0	402.1	402.0	401.8	401.6	401.3	401.0	400.6
400.2	399.8	399.5	399.1	398.7	398.3	397.9	397.4	396.9	396.4
395.9	395.4	395.0	394.6	394.2	393.8	393.5	393.2	393.0	392.7
392.5	392.3	392.1	392.0	391.9	391.8	391.7	391.6	391.6	391.5
391.4	391.3	391.2	391.1	391.0	391.0	390.9	390.9	390.9	390.8
390.8	390.8	390.7	390.7	390.7	390.6	390.6	390.5	390.5	390.4
390.4	390.4	390.3	390.3	390.3	390.2	390.2	390.2	390.2	390.2
390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	P128.	5409.	1551.	1242.	223551.
CMS	230.	153.	44.	35.	6330.
INCHES		11.18	12.P2	12.84	12.84
MM		284.00	325.67	326.05	326.05
AC-FT		2682.	3076.	3079.	3079.
THOUS CU M		3308.	3794.	3798.	3798.

MAXIMUM STORAGE = 32.

MAXIMUM STAGE IS 402.1

STATION A6, PLAN 2, RTIO 2

OUTFLOW

40.	24.	13.	P.	5.	5.	4.	5.	5.	5.
[illegible]	6.	6.	6.	6.	6.	6.	6.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.	7.	8.	10.	14.	19.	26.
37.	50.	66.	83.	102.	122.	144.	166.	187.	207.
227.	244.	259.	272.	284.	298.	307.	316.	323.	328.
332.	335.	338.	341.	346.	356.	374.	407.	457.	528.
617.	713.	789.	834.	869.	907.	956.	1116.	1625.	2547.
3222.	3809.	3573.	3777.	4036.	4423.	4902.	5481.	6166.	6879.
7531.	7943.	8123.	8147.	8023.	7780.	7455.	7061.	6633.	6201.
5787.	5407.	5052.	4692.	4307.	3927.	3567.	3194.	2807.	2469.
2167.	1881.	1672.	1498.	1324.	1183.	1107.	1068.	1035.	1001.
975.	958.	945.	931.	915.	899.	882.	864.	847.	827.
788.	716.	629.	533.	453.	384.	328.	291.	271.	249.
225.	204.	186.	170.	156.	143.	130.	119.	107.	97.
87.	78.	69.	62.	55.	49.	44.	39.	35.	31.
28.	25.	22.	20.	18.	17.	15.	14.	13.	12.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	2.	2.	2.	2.
3.	3.	3.	3.	3.	3.	3.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	5.
5.	6.	6.	7.	7.	7.	7.	8.	10.	14.
16.	17.	17.	18.	19.	20.	22.	24.	26.	28.
30.	32.	32.	32.	32.	31.	30.	29.	28.	26.
25.	24.	22.	21.	20.	19.	17.	16.	15.	14.
12.	11.	11.	10.	9.	8.	8.	8.	8.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
6.	6.	5.	5.	4.	4.	4.	3.	3.	3.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

390.0	390.1	390.1	390.0	390.0	390.0	390.0	390.0	390.0	390.0
390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0
390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0
390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0
390.0	390.0	390.0	390.0	390.0	390.0	390.1	390.1	390.1	390.1
390.2	390.3	390.4	390.5	390.6	390.7	390.8	390.9	391.0	391.1
391.2	391.4	391.4	391.5	391.6	391.6	391.6	391.7	391.7	391.7
391.7	391.7	391.7	391.7	391.7	391.8	391.8	391.9	392.1	392.3
392.5	392.8	393.0	393.1	393.2	393.3	393.4	393.7	394.0	394.4
394.7	397.5	397.7	398.0	398.3	398.7	399.2	399.8	400.4	401.1
401.6	401.9	402.1	402.1	402.0	401.8	401.5	401.2	400.8	400.4
400.1	399.7	399.4	399.0	398.6	398.1	397.7	397.2	396.7	396.3
395.7	395.2	394.8	394.5	394.1	393.9	393.7	393.6	393.5	393.5
393.4	393.4	393.3	393.3	393.3	393.3	393.2	393.2	393.1	393.1
393.0	392.8	392.6	392.3	392.0	391.9	391.7	391.6	391.5	391.4
391.2	391.1	391.0	390.9	390.9	390.8	390.7	390.7	390.6	390.5
390.5	390.4	390.4	390.3	390.3	390.3	390.2	390.2	390.2	390.2
390.2	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1	390.1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8147.	4012.	1464.	1173.	211071.
CMS	231.	114.	41.	33.	5977.
INCHES		9.95	12.11	12.12	12.12
MM		252.64	307.47	307.85	307.85
AC-FT		2386.	2904.	2907.	2907.
THOUS CU M		2943.	3582.	3586.	3586.

MAXIMUM STORAGE = 32.

MAXIMUM STAGE IS 402.1

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .20	RATIO 2 .50	RATIO 3 1.00
HYDROGRAPH AT	A1	4.50	1	3266.	8165.	16329.
	(	11.65)	(	92.48)(	231.20)(	462.39)(
			2	3266.	8165.	16329.
			(	92.48)(	231.20)(	462.39)(
ROUTED TO	A2	4.50	1	7471.	8138.	16308.
	(	11.65)	(	211.56)(	230.43)(	461.79)(
			2	3257.	8168.	16341.
			(	92.22)(	231.29)(	462.71)(
ROUTED TO	A3	4.50	1	7511.	8141.	16302.
	(	11.65)	(	212.68)(	230.53)(	461.63)(
			2	3263.	8173.	16351.
			(	92.40)(	231.44)(	463.00)(
ROUTED TO	A4	4.50	1	7462.	8128.	16290.
	(	11.65)	(	211.29)(	230.17)(	461.29)(
			2	3252.	8170.	16350.
			(	92.10)(	231.34)(	462.99)(
ROUTED TO	A5	4.50	1	7288.	8123.	16264.
	(	11.65)	(	206.38)(	230.02)(	460.56)(
			2	3255.	8145.	16326.
			(	92.16)(	230.65)(	462.30)(
ROUTED TO	A6	4.50	1	7320.	8128.	16272.
	(	11.65)	(	207.29)(	230.15)(	460.76)(
			2	3244.	8147.	16299.
			(	91.87)(	230.71)(	461.54)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	698.20	698.20	707.30
STORAGE	172.	172.	332.
OUTFLOW	0.	0.	1150.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	708.06	.76	346.	7553.	.42	17.10	16.50
.50	708.03	.73	346.	8138.	.42	17.17	14.67
1.00	708.29	.99	350.	16308.	.48	17.17	13.83

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	698.20	698.20	707.30
STORAGE	172.	172.	332.
OUTFLOW	0.	0.	1150.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.20	708.66	1.36	358.	3287.	3.33	17.17	0.00
.50	710.43	3.13	391.	8168.	6.17	17.17	0.00
1.00	712.62	5.32	431.	16341.	7.83	17.17	0.00

PLAN 1 STATION A3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	7511.	665.7	17.17
.50	8141.	666.4	17.17
1.00	16302.	673.6	17.17

PLAN 2 STATION A3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	3263.	660.3	17.17
.50	8172.	666.4	17.17
1.00	16351.	673.7	17.17

PLAN 1 STATION A4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	7462.	658.5	17.17
.50	8139.	661.5	17.33

1.00	16290.	665.7	17.17

PLAN 2 STATION A4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	3252.	653.4	17.17
.50	8170.	659.5	17.17
1.00	16350.	665.7	17.17

PLAN 1 STATION A5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	7288.	555.0	17.17
.50	8123.	556.0	17.33
1.00	16264.	564.1	17.33

PLAN 2 STATION A5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	3255.	549.9	17.33
.50	8145.	556.0	17.17
1.00	16326.	564.1	17.17

PLAN 1 STATION A6

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	7320.	401.4	17.33
.50	8120.	402.1	17.33
1.00	16272.	407.2	17.33

PLAN 2 STATION A6

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.20	3244.	397.3	17.33
.50	8147.	402.1	17.33
1.00	16288.	407.3	17.17

APPENDIX 4

ENGINEERING DATA

YOUNGS POND DAM

Form 15 SC-5-59

Dam Application No. 615

Map No. 21-63

State of New Jersey
Division of Water Policy and Supply

REPORT ON DAM APPLICATION

Application of Kenneth W. Young

filed February 24, 1972 for approval of plans and for a permit to construct

a dam for the impoundment of Young's Pond across Jacksonburg Creek

tributary to Paulins Creek in the Township of Blairstown

County, New Jersey, has been examined by S.A. Aziz

PRINCIPAL FEATURES

Purpose of dam	Preservation and promotion of fish life	Type of dam	earthfill - existing
Site inspected	-	Foundation material	sandy, clayey silt
Location:	21-33-7-5-3	Maximum height	25.57 feet
Drainage area	4.5 sq. mi.	Length of dam	425 feet
Elevation of flow line	698.15	Top width of dam	15 feet
Area of lake	12 acres	Downstream slope	2:1
Capacity of lake	--- million gallons	Upstream slop-	3:1

Type of spillway drop inlet

Length of spillway 62 feet C = 3.1

Design flood flow 1670 cubic feet per second = 372 sec. ft. per sq. mi.

Head on spillway for design flood flow 4.25 feet

Freeboard 1.21 feet

Maximum spillway capacity (dam owash) = 57,000 cubic feet per second

= 12,650 sec. ft. per sq. mi.

Outlet other than spillway 12 inch C.I.P.

Drawings filed by Ilmar Aasmaa, P.E.
Ledgewood, Consulting Engineers, N.J.

Hydrology:

Q 50 Mean of N and CJ curves = 1670 cfs.

Hydraulic:

Weir flow L = 62'
C = 3.1
H = 4.26

Q = 3.1 x 62 x 4.25 3/2
= 192 x 8.7
= 1670.0 cfs

Culvert flow
Area 8' x 7' = 56 ft^2
H
p = 13.94 feet
Length = 63 feet

Q = 1100 cfs.

Embankment:

Slopes of the existing dam have been modified to increase stability factor.

DAM APPLICATION NO. 615

The drawings prepared by Mr. Ilmar Aasmaa of Morris Engineers, Inc. are hereby approved.

Sheet No.	Date
1	August 21, 1971, March 20, 1972, April 29, 1972 and May 20, 1972.
2	April 25, 1972 and May 20, 1972.
3	April 20, 1972, revised May 4, 1972, May 20, 1972 and May 31, 1972.
4	April 25, 1972 and May 20, 1972.
5	January 4, 1972, March 20, 1972 and April 26, 1972.
6	April 25, 1972, March 20, 1972 and May 31, 1972

It has been found that the site for the dam is suitable and the plans adequate to insure the construction of a structure which will not be a menace to life or property under design flood conditions. It is therefore recommended that the plans be approved and that a permit be issued subject to standard conditions and to the following special conditions:

The following drawings preparedby Ilmar Aasmaa of Morris Engineers, Inc., are hereby approved.

Sheet No.	Dated
1	August 21, 1971, March 20, 1972, April 29, 1972 and May 20, 1972.
2	April 25, 1972 and May 20, 1972.
3	April 20, 1972, revised May 4, 1972, May 20, 1972 and May 31, 1972.
4	April 25, 1972 and May 20, 1972.
5	January 4, 1972, March 20, 1972, and April 26, 1972.
6	April 25, 1972, March 20, 1972 and May 31, 1972

Chief, Bureau of Water Control

Chief Engineer

Trenton, New Jersey

June 29, 1972

MORRIS ENGINEERS INC.

STRUCTURES • FOUNDATIONS • SEWAGE DISPOSAL • MUNICIPAL ENGINEERING • PLANNING

P.O. BOX 289
LEDGEWOOD
NEW JERSEY 07852

BUS. 584-4148
RES. 201-627-8108

September 18, 1972

Mr. Syed Aziz
Department of Environmental Protection
State of New Jersey
Division of Water Resources
P.O. Box # 1390
Trenton, New Jersey, 08625

Re.: Jacksenburg Creek Dam, Application No. 615.
Drawing Number One of the project.

Dear Mr. Aziz:

On your request we have computed the areas under water at the Young's pond during four different flood levels and came up with the following:

1. Operating level at Elevation 698.15 - approximately 622,709 sq. ft. or 14.30 Acres.
2. Flood line at Elev. 700.15 - approximate area 711,797 Sq. ft. or 16.34 Acres.
3. Flood line at Elev. 702.15 - approximate area 778,460 sq. ft. or 17.87 Acres.
4. Flood line at crest of dam - Elev. 703.61 - approximate area 876,732 sq.ft., or 20.13 Acres.

At this time the construction of concrete spillway is well under way and a good progress can be expected shortly.

Very truly yours,

Ilmar Ammaa, Pres.
P.E.

MEMORANDUM

DATE: 3/22/72

TO: Robert L. Hardman, Assistant Director
Division of Water Resources

FROM: Russell A. Cookingham, Director
Division of Fish, Game and Shellfisheries

SUBJECT: PROPOSED DAM CONSTRUCTION
Application No. 615

Receipt is acknowledged of notice furnished February 29, 1972 of the application filed on February 24, 1972 by

Kenneth W. Young
18 Young Avenue
Cedar Grove, N.J.

for permit to construct a dam across Jacksonburg Creek

in the Township of Blairstown, Warren County.

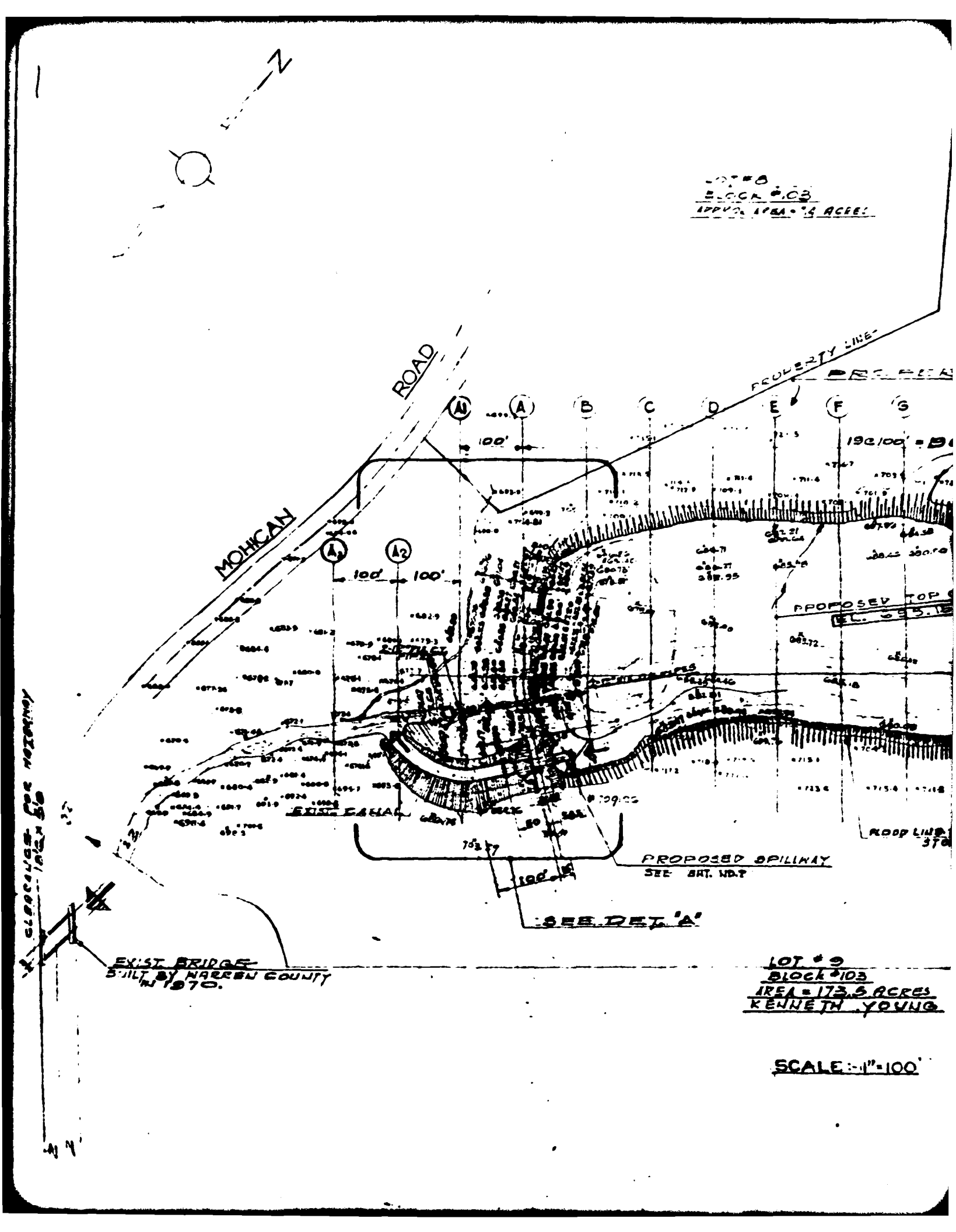
Pertinent features of the proposed dam:

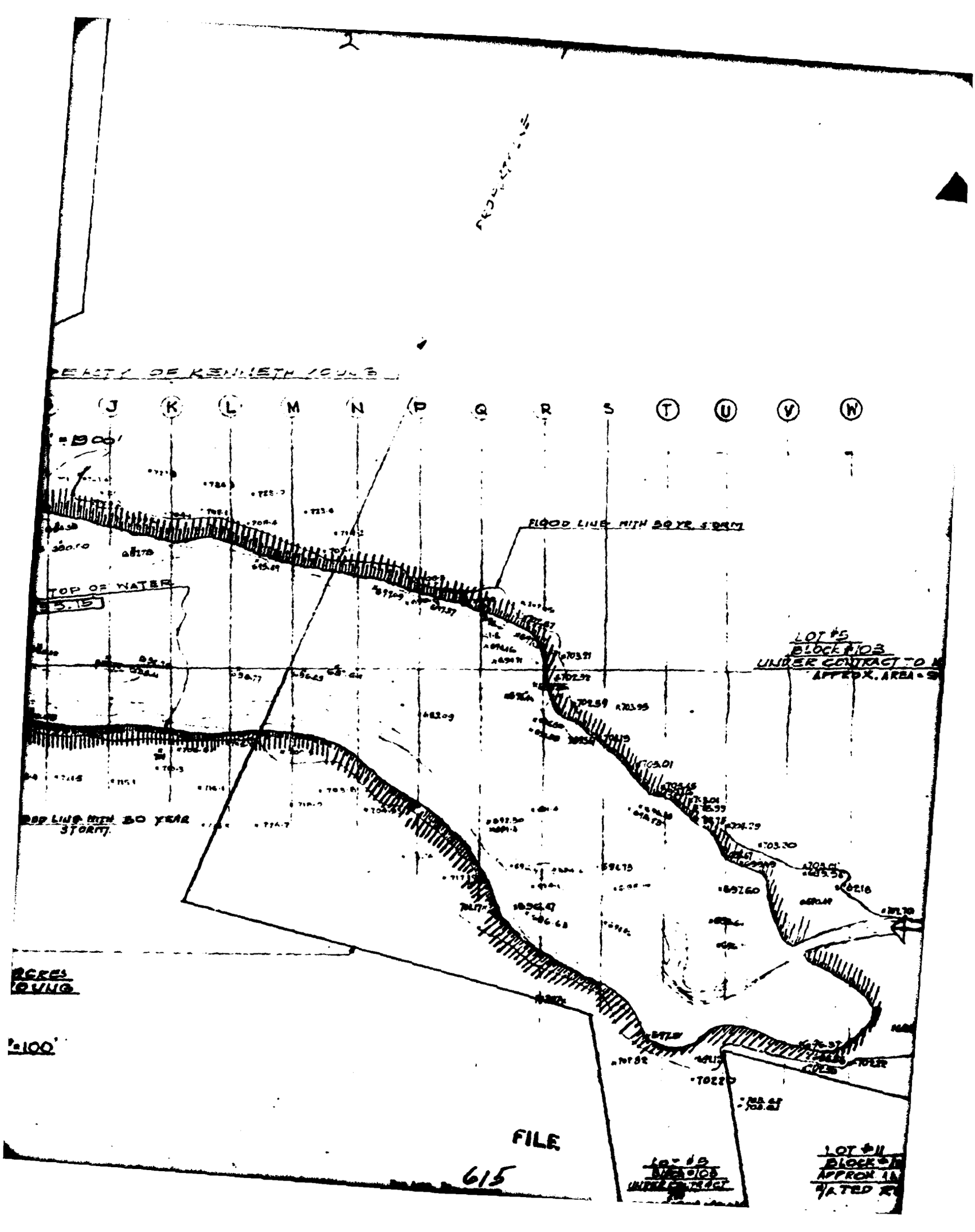
State Atlas Sheet Location:	21.33.7.5.3	
Drainage Area:	4.5	square miles
Normal Water Surface Area:	12	acres
Normal Volume of Impoundment:	---	million gallons
Type of Dam:	Earthfill - Existing Dam	
Maximum Height:	19	feet
Length:	425	feet
Top Width:	18	feet

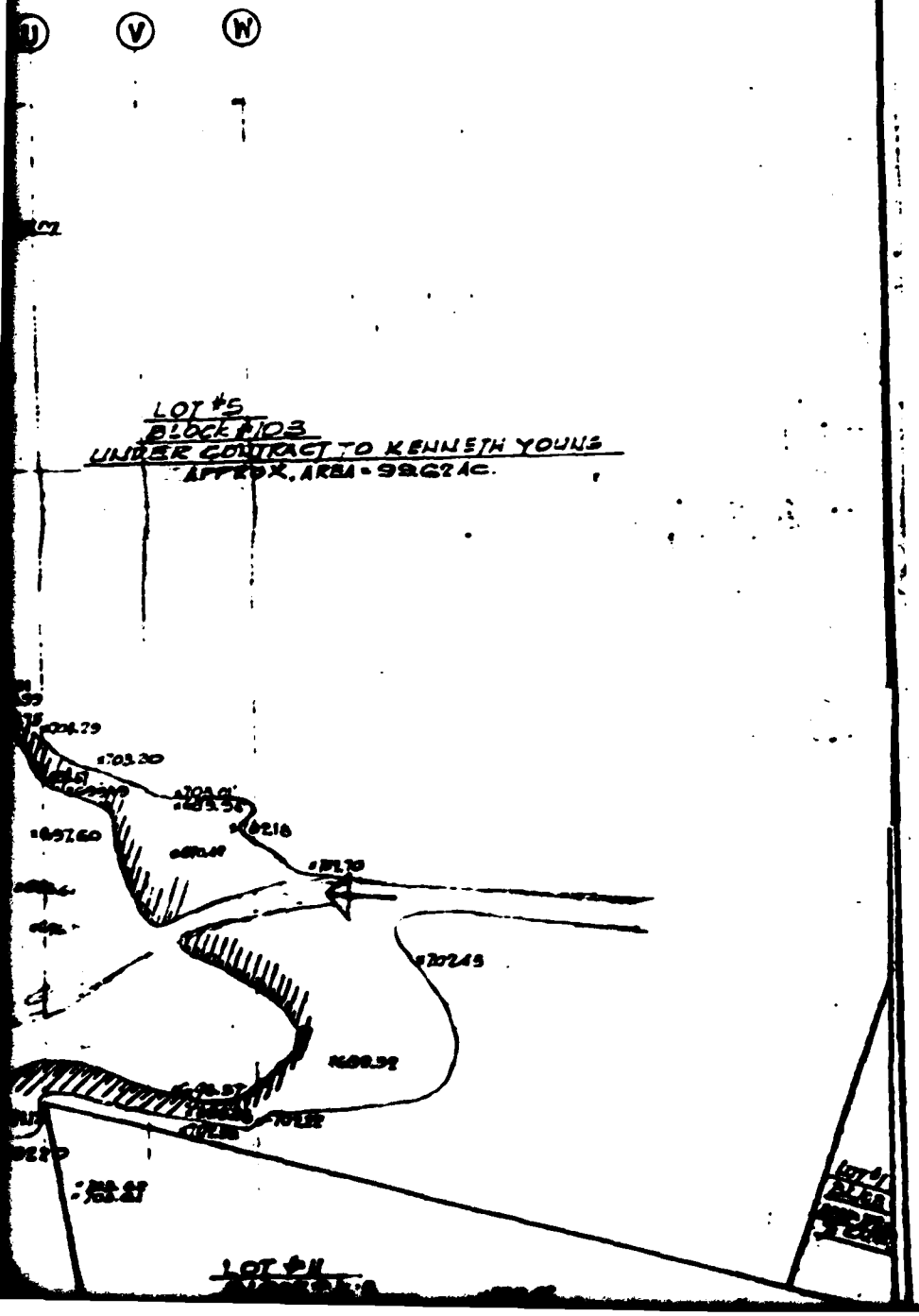
With respect to the necessity for incorporation of a fish ladder in the subject proposed dam, please be advised that

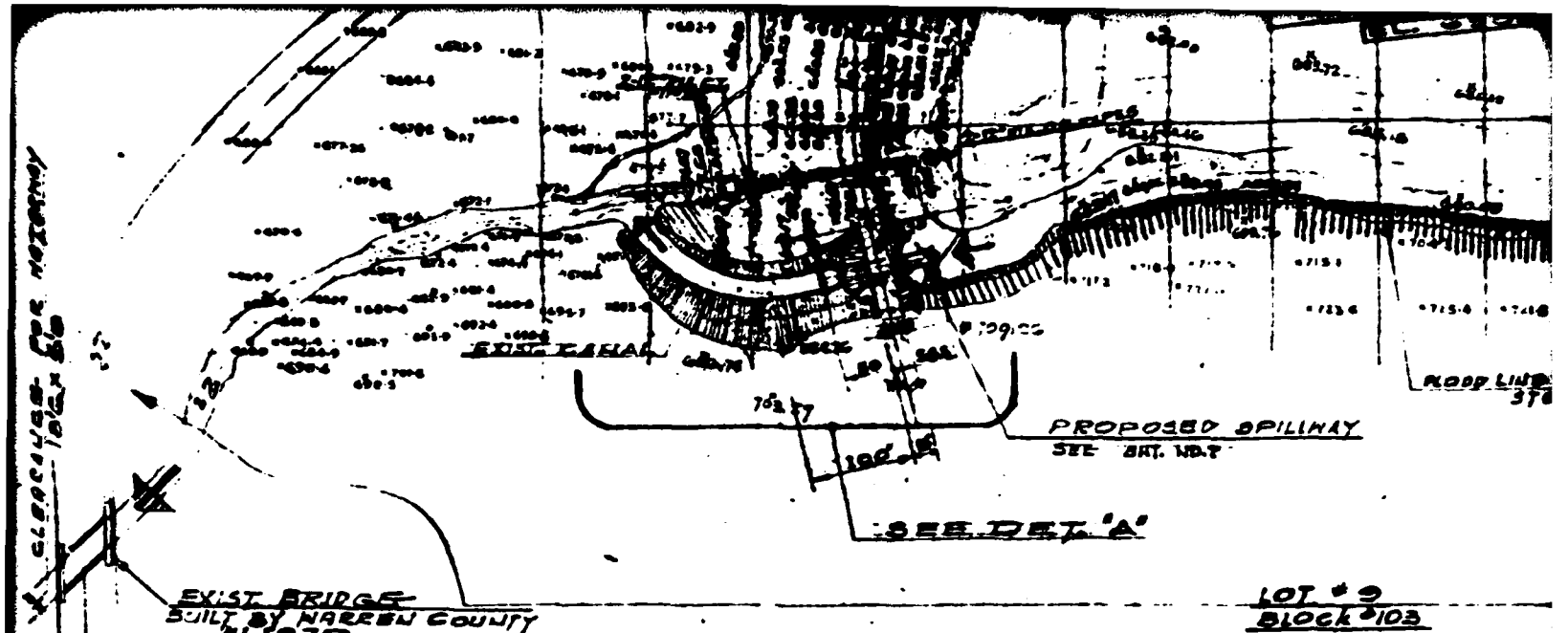
no fish ladder is required at this site. However, a cold water release structure is recommended for the dam.

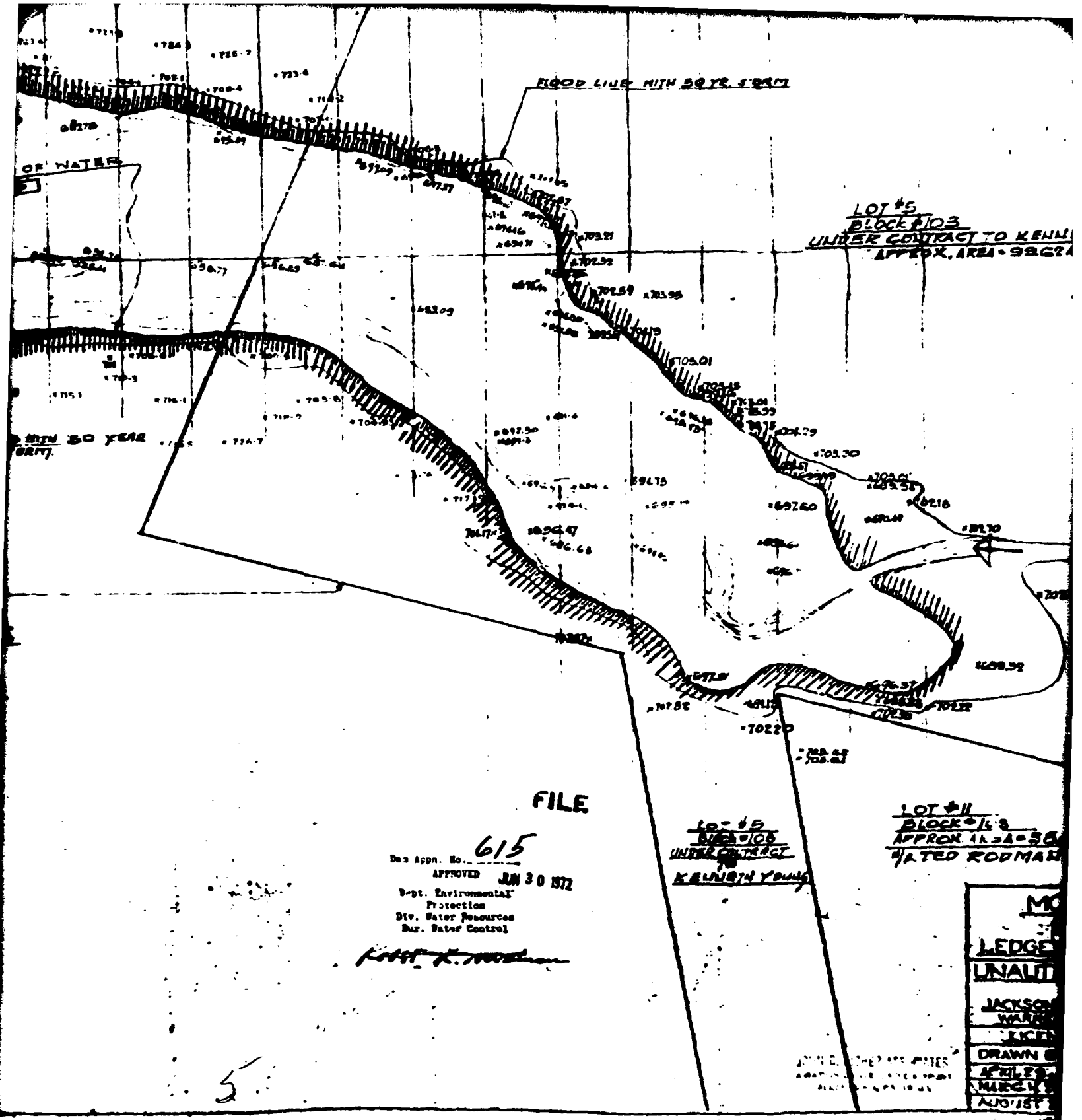
Director


N
LOT #8
BLOCK #103
APPROX. AREA = 15 ACRES
PROPERTY LINE
ROAD
MOHICAN
A1
A
B
C
D
E
F
G
A2
100'
100'
100'
PROPOSED TOP
EL. 755.15
EXIST. CANAL
PROPOSED SPILLWAY
SEE SHT. NO. 7
SEE DET. 'A'
EXIST. BRIDGE
BUILT BY WARREN COUNTY
IN 1970.
LOT # 9
BLOCK #103
AREA = 173.5 ACRES
KENNETH YOUNG
SCALE: 1" = 100'

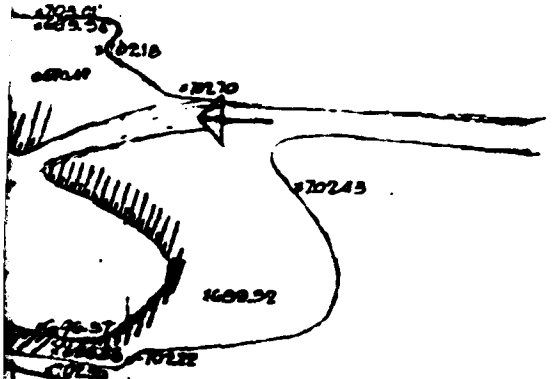

J
K
L
M
N
P
Q
R
S
T
U
V
W
FLOOD LINE WITH 50 YR STORM
TOP OF WATER
LOT #5
BLOCK #103
UNDER CONTRACT TO
APPROX. AREA
FLOOD LINE WITH 50 YEAR STORM
FILE
615


U
V
W
LOT #5
BLOCK #103
UNDER CONTRACT TO KENNETH YOUNG
APPROX. AREA = 92.62 AC.
LOT #11


EXIST. CANAL
PROPOSED SPILLWAY
SEE SHT. NO. 7
SEE DET. 'A'
EXIST. BRIDGE
BUILT BY WARREN COUNTY
IN 1970.
LOT # 3
BLOCK # 103
AREA = 173.3 ACRES
KENNETH YOUNG
SCALE :- 1" = 100'
4


FLOOD LINE WITH 50 YR. STORM
OF WATERS
LOT #5
BLOCK #103
UNDER CONTRACT TO KENN
APPROX. AREA = 98,07
WITH 50 YEAR
STORM.
FILE
Dam Appn. No. 615
APPROVED JUN 30 1972
Dept. Environmental
Protection
Div. Water Resources
Bur. Water Control
LOT #5
BLOCK #103
UNDER CONTRACT
KENNETH YOUNG
LOT #11
BLOCK #13
APPROX AREA = 30
ALTED RODMAN
LEDGE
UNALI
JACKSON
WAR
LICE
DRAWN
APRIL 2
MARCH
AUGUST
5

LOT #5
BLOCK #103
IS CONTRACT TO KENNETH YOUNG
APPROX. AREA = 98.62 AC.



LOT #11
BLOCK #103
APPROX. AREA = 38.05 AC.
N/A TED RODMAN

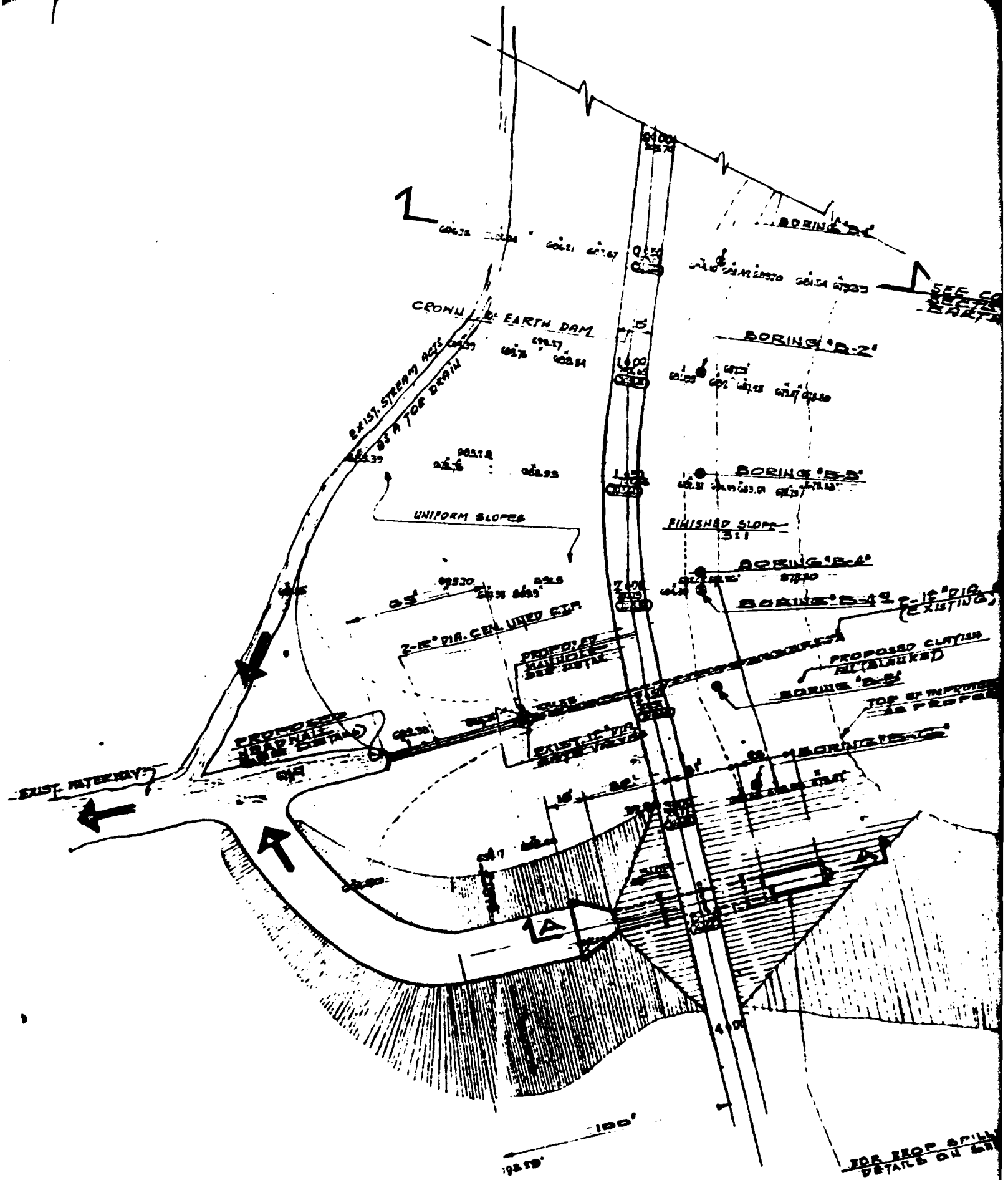
MORRIS ENGINEERS, INC.
BY
LEDGEWOOD CONSULT. ENGRS. N.J.

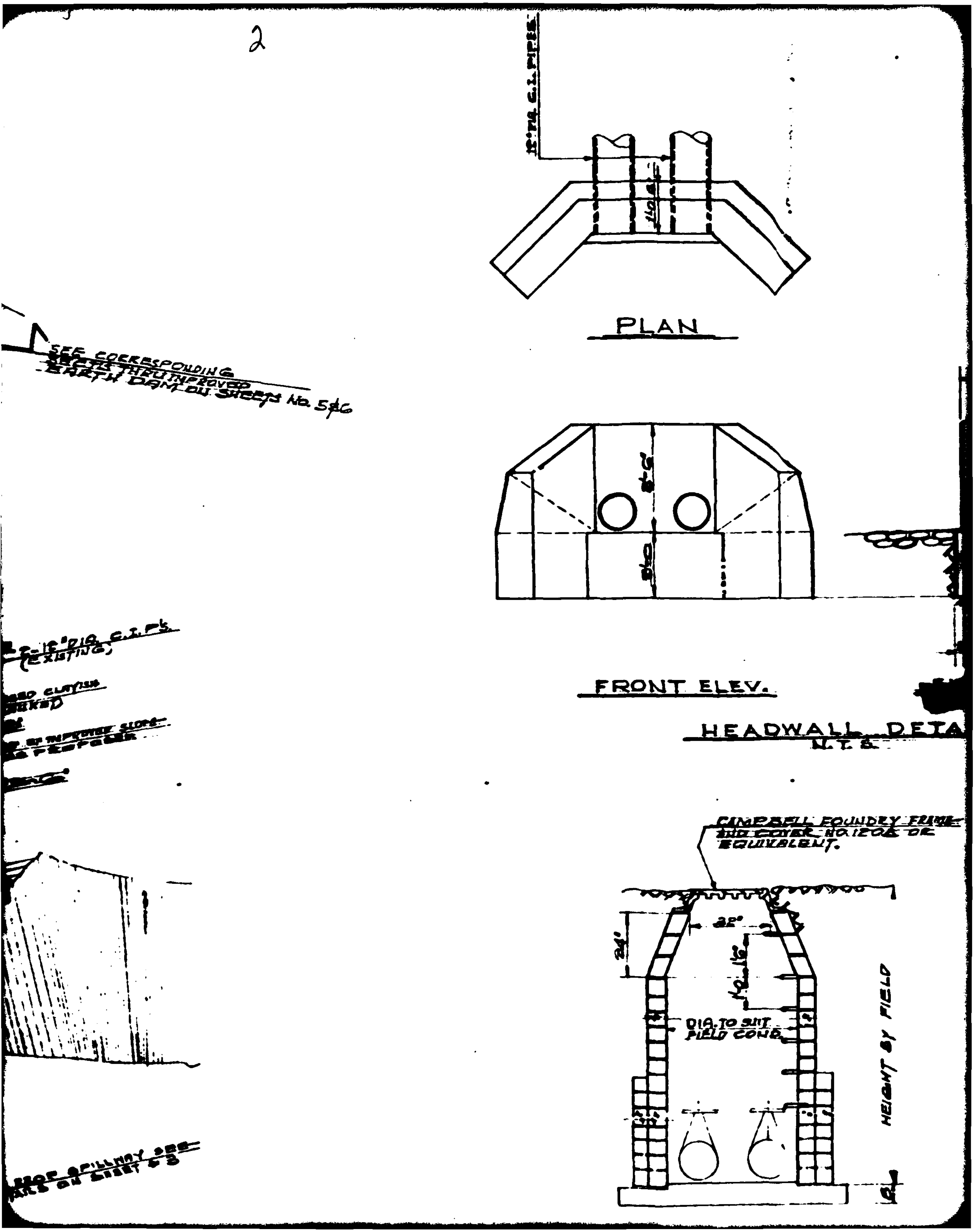
UNAUTHORISED ENCROACHMENT
NO:- D-358
JACKSONBURG CREEK, TWP OF BLAIRSTOWN
WARREN COUNTY, STATE OF NEW JERSEY
LICENSE NO:- 10614

DRAWN BY-HS	CHECKED BY-H.A
APRIL 29, 1972	
MARCH 20, 1972	
AUGUST 21, 1971	

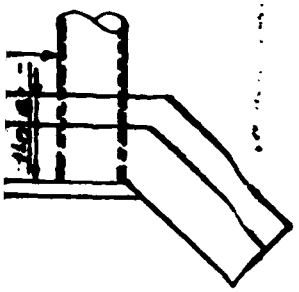
1

6

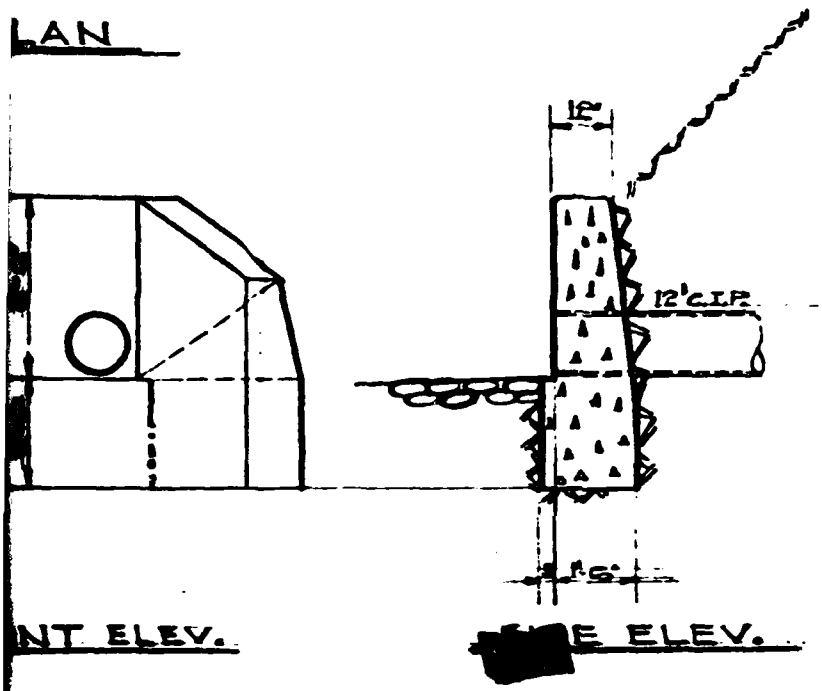

BORING 'B-1'
CROWN OF EARTH DAM
EXIST. STREAM ACTS AS TOP DRAIN
BORING 'B-2'
BORING 'B-3'
UNIFORM SLOPES
FINISHED SLOPE 3:1
BORING 'B-4'
2-18" DIA. CEM. LINED CMP
PROPOSED MANHOLE SEE DETAIL
PROPOSED CLAY SEAL (BLANKET)
BORING 'B-5'
PROPOSED HEADWALL
EXIST. WATERWAY
EXIST. 24" DIA. CMP
100'
DET. 'A'



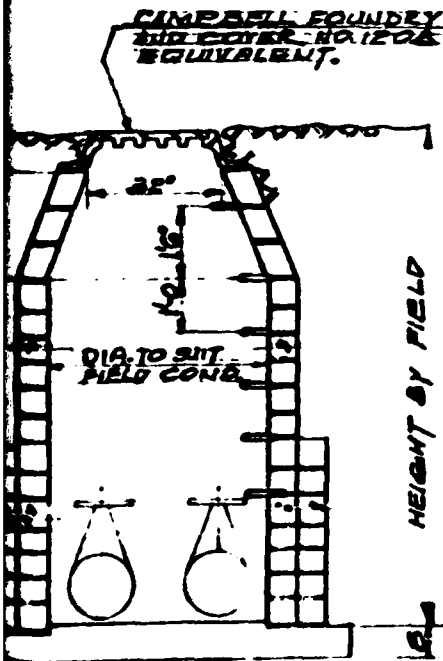
2
12" DIA. C.I. PIPES
PLAN
SEE CORRESPONDING
SECTIONS THRU IMPROVED
EARTH DAM ON SHEETS NO. 5 & 6
2-12" DIA. C.I.P's.
(EXISTING)
FRONT ELEV.
HEADWALL DETA
N.T.S.
CAMPBELL FOUNDRY FRAME
AND COVER NO. 1206 OR
EQUIVALENT.
22"
24"
DIA. TO SUIT
FIELD COND.
HEIGHT BY FIELD



LAN



HEADWALL DETAILS
N.T.S.

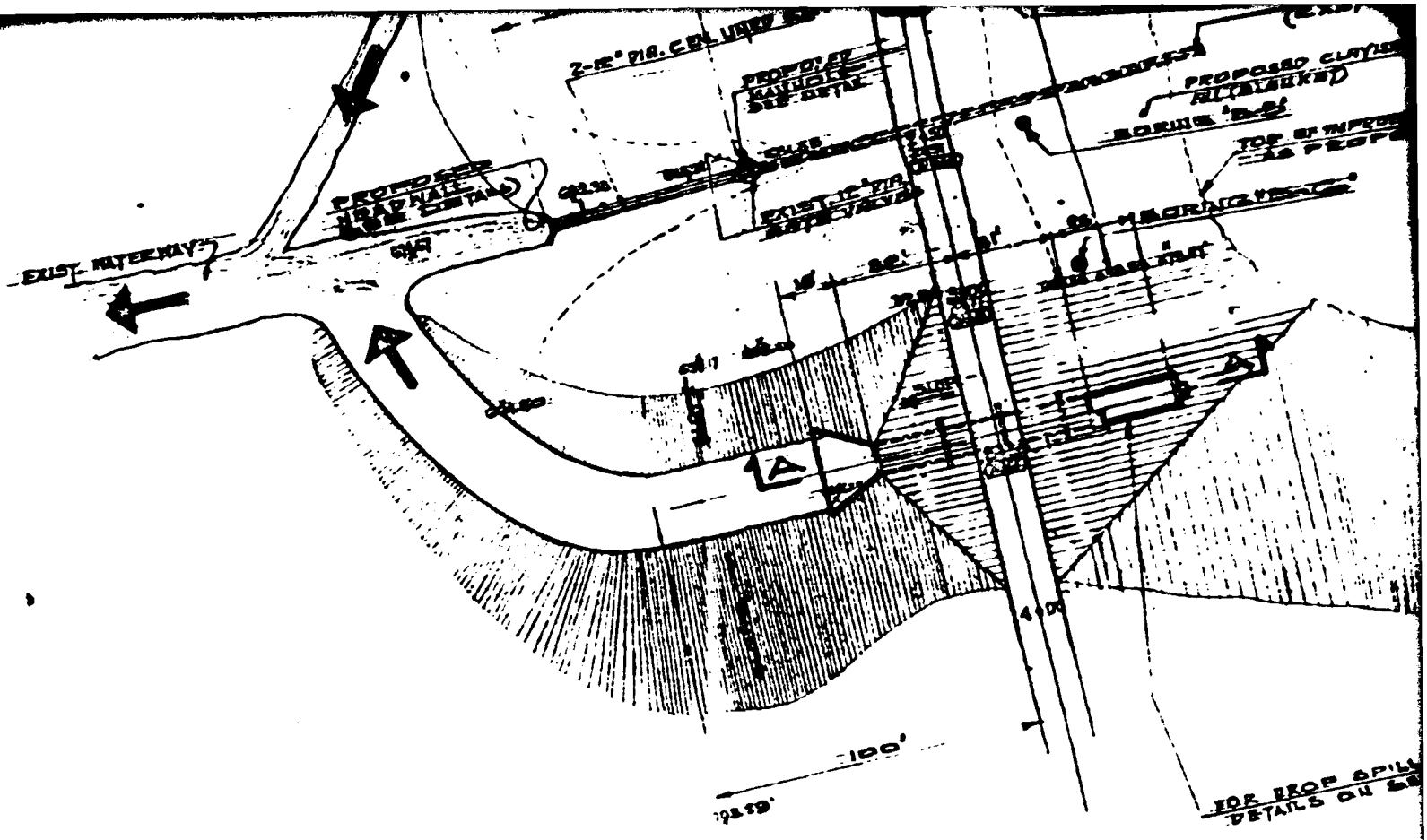


FILE

615

APPROVED JUN 30 1972

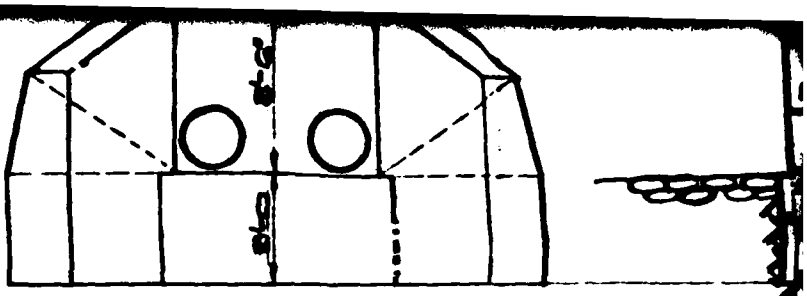
Robert L. Hartman



DET. 'A'

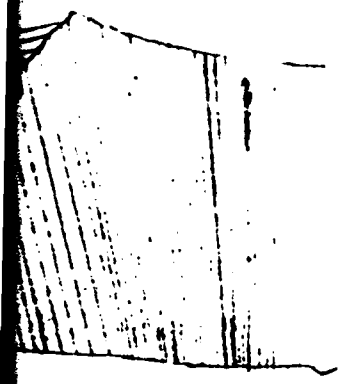
SCALE: 1" = 50'

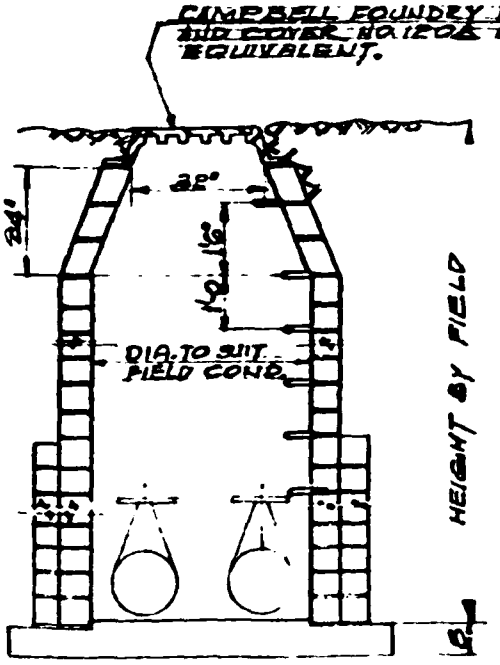
689.75 THUS INDICATES EXIST. GRADE
708.61 INDICATES FINISHED GRADE



FRONT ELEV.

HEADWALL DETAI
N.T.S.





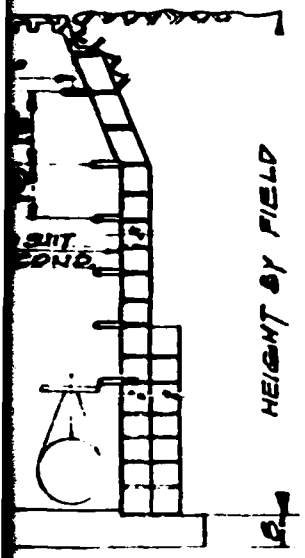
DETAIL OF MANHOLE

4

EV. [redacted] E ELEV.

ADWALL DETAILS
N.T.S.

MPBELL FOUNDRY FRAME
COVER NO 1202 OR
QUIVALENT.



OF MANHOLE

FILE

615

APPROVED JUN 30 1972

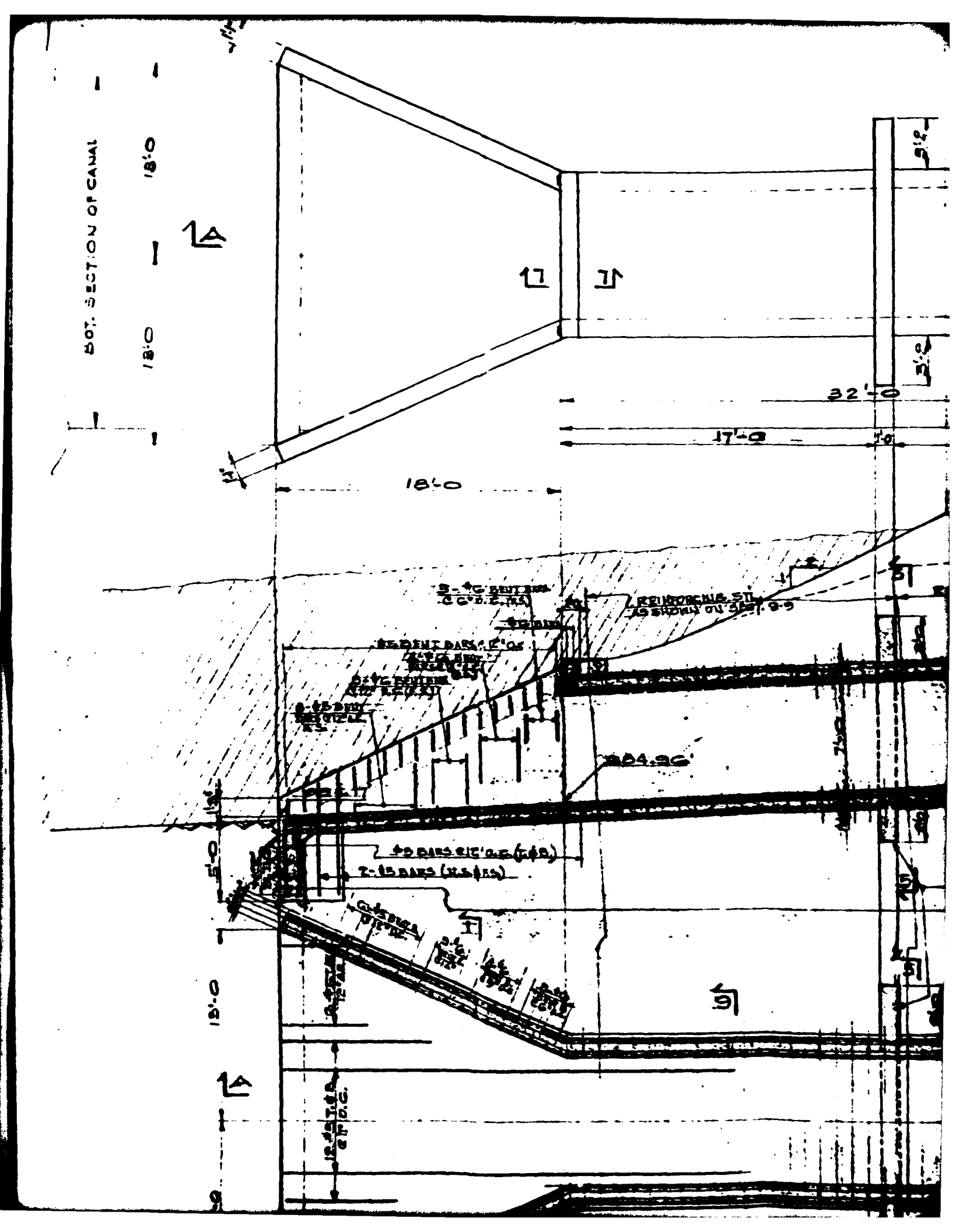
Div. Water Control

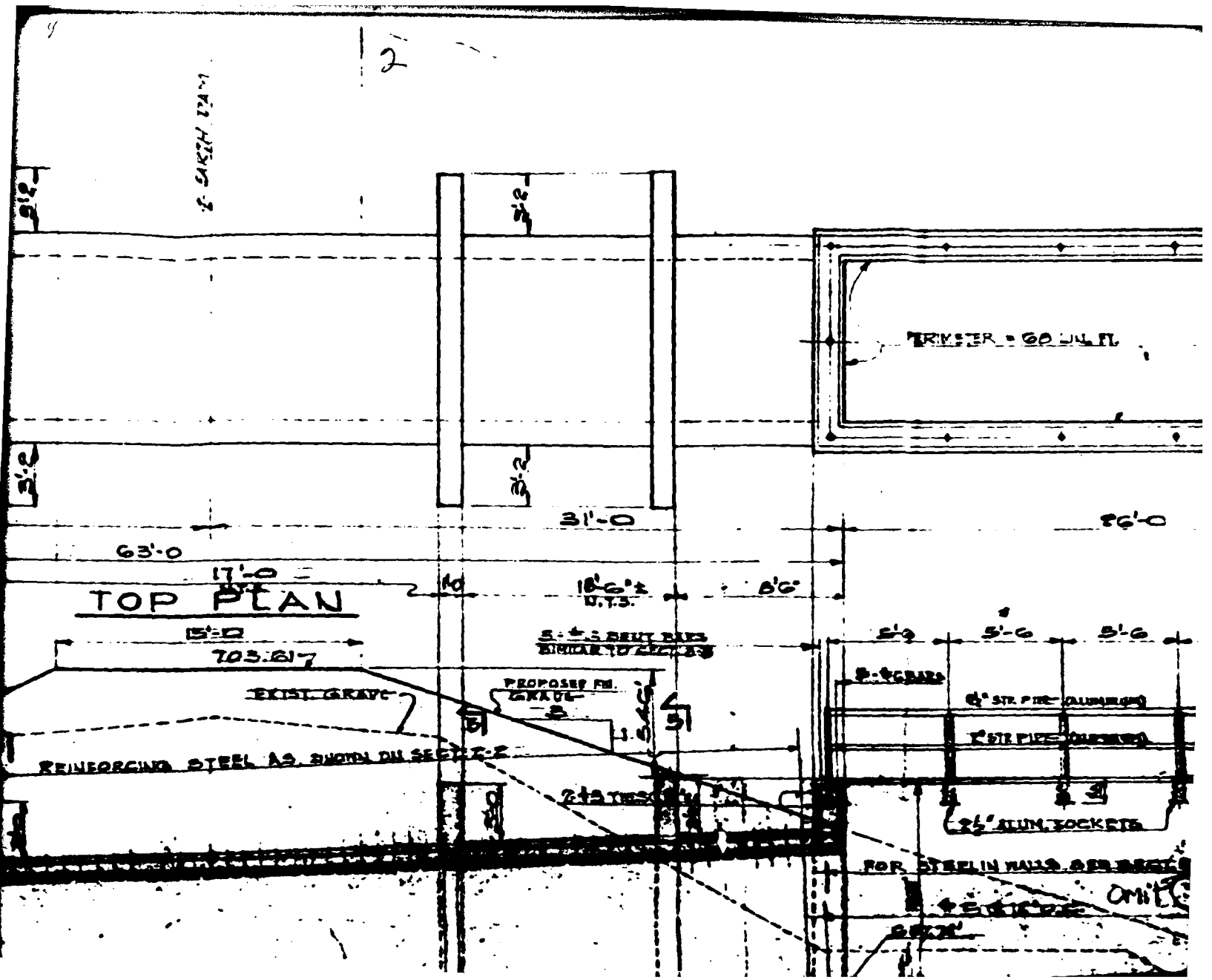
Robert L. Hardman

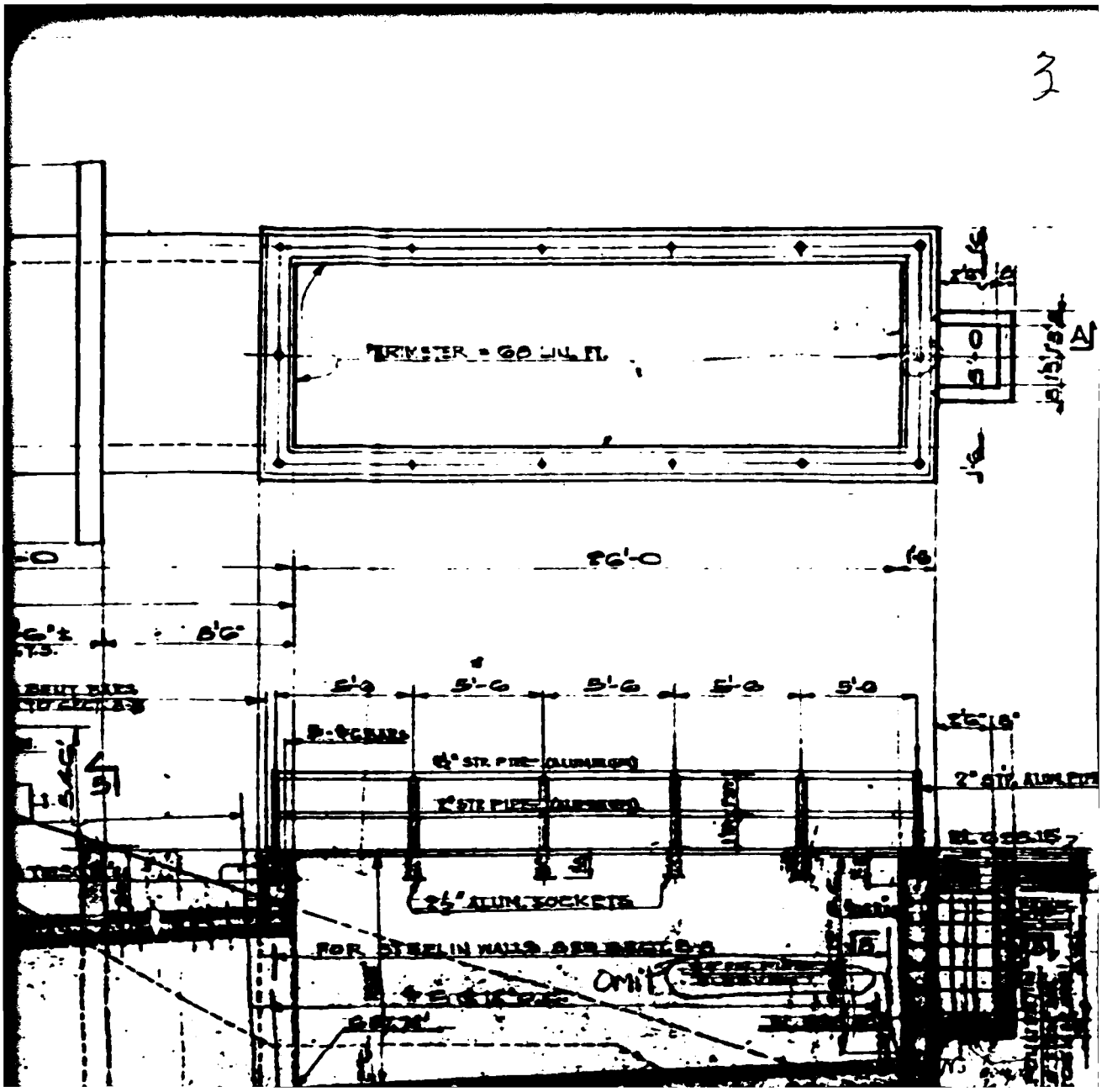
JOHN B. AICHER ASSOCIATES
MORRIS ENGINEERS, INC.
BY
LEDGEWOOD, CONSULT. ENGINEERS, N.J.

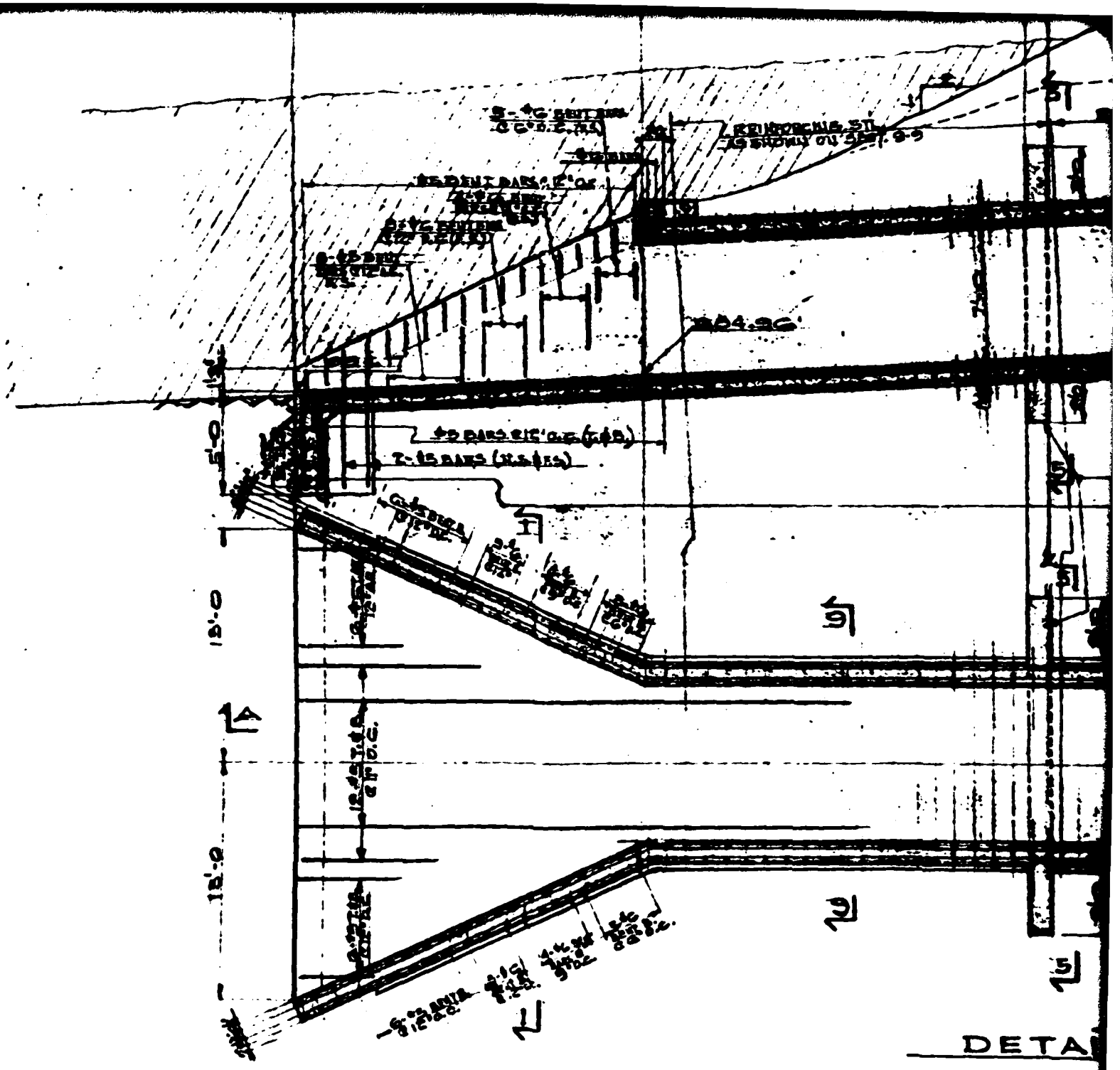
UNAUTHORISED ENCROACHMENT
NO1-E-35C
JACKSONSBURG CREEK, TWPS OF BLAIRSTOWN
WARREN COUNTY, STATE OF NEW JERSEY

LICENSE NO. 10814		
DRAWN BY: LA	CHECKED BY:	2
4/28/72	I.A.	
5/30/72		


BOT. SECTION OF CANAL
18'-0
18'-0
32'-0
17'-9
18'-0
EL 84.90
18'-0


TOP PLAN
63'-0
31'-0
26'-0
17'-0
15'-0
18'-6"±
B'-6"
5'-6
5'-6
EXIST. GRADE
PROPOSED FIN. GRADE
REINFORCING STEEL AS SHOWN ON SECTION X-X
2½" STEEL SOCKETS
FOR STEPLIN
Omit


3
5'-0
5'-0
5'-0
5'-0
5'-0
Omit



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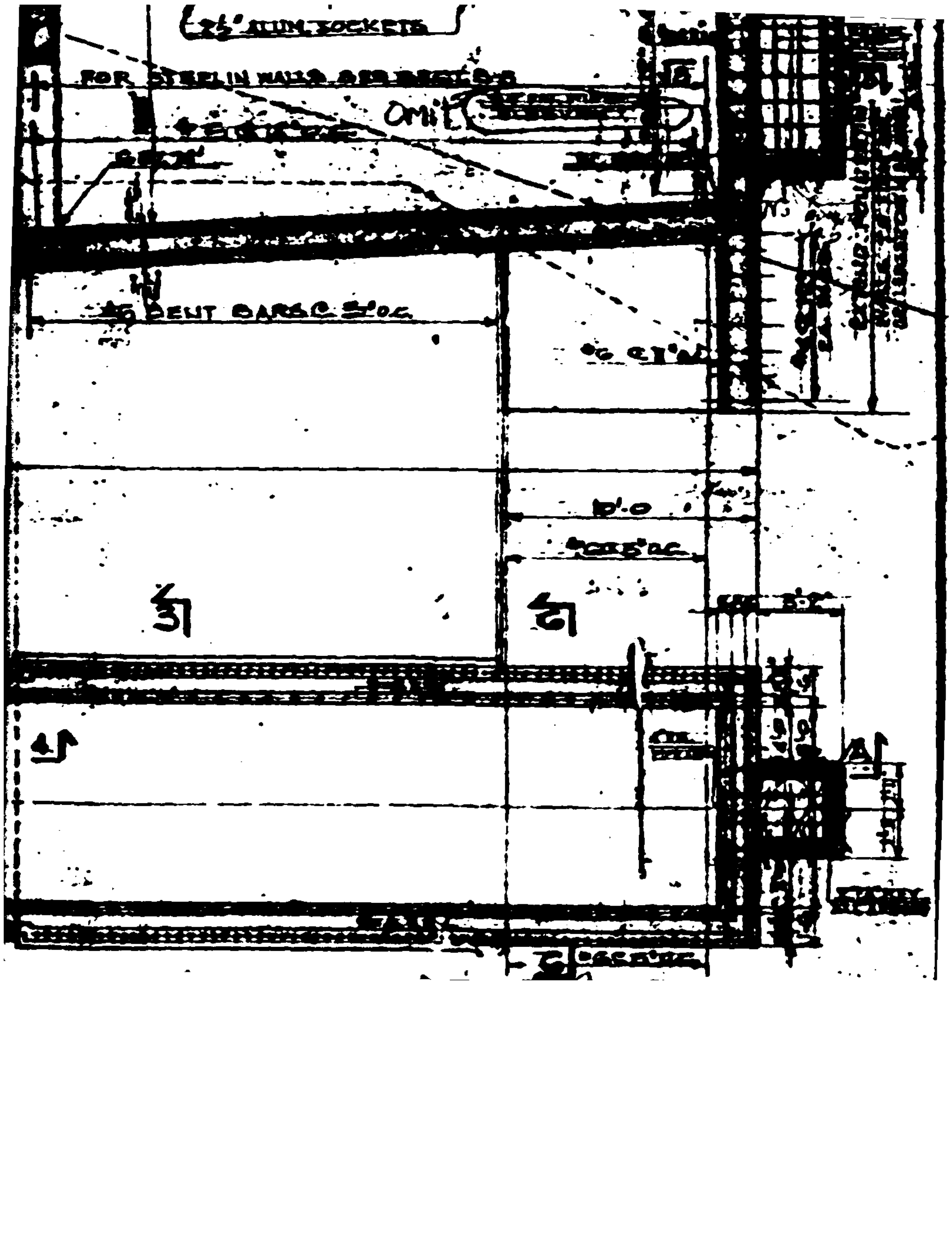
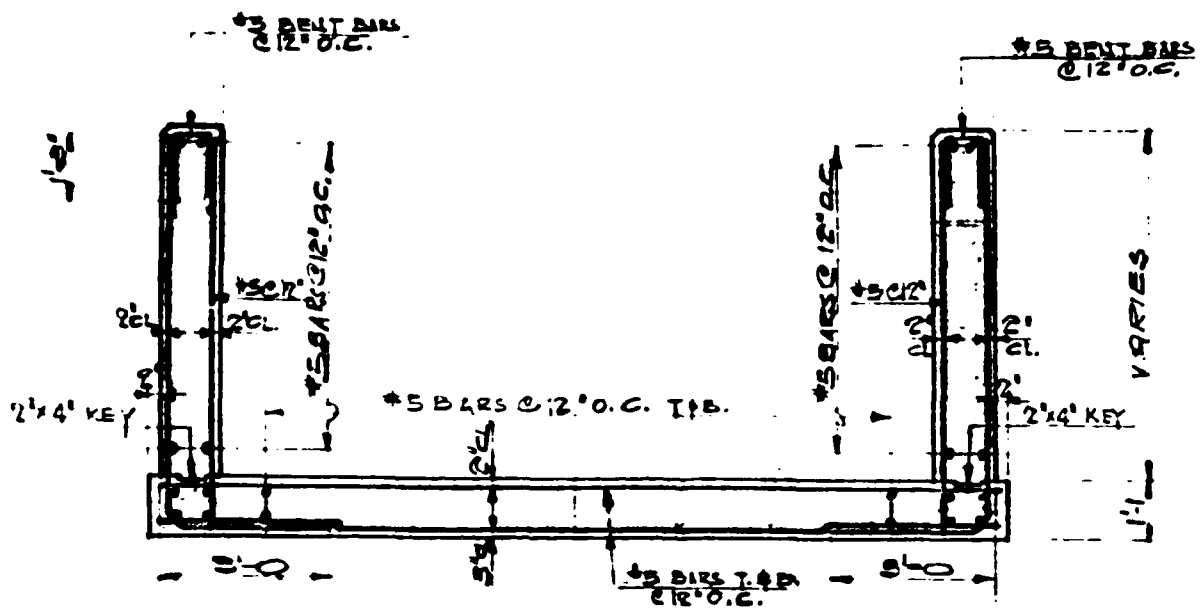
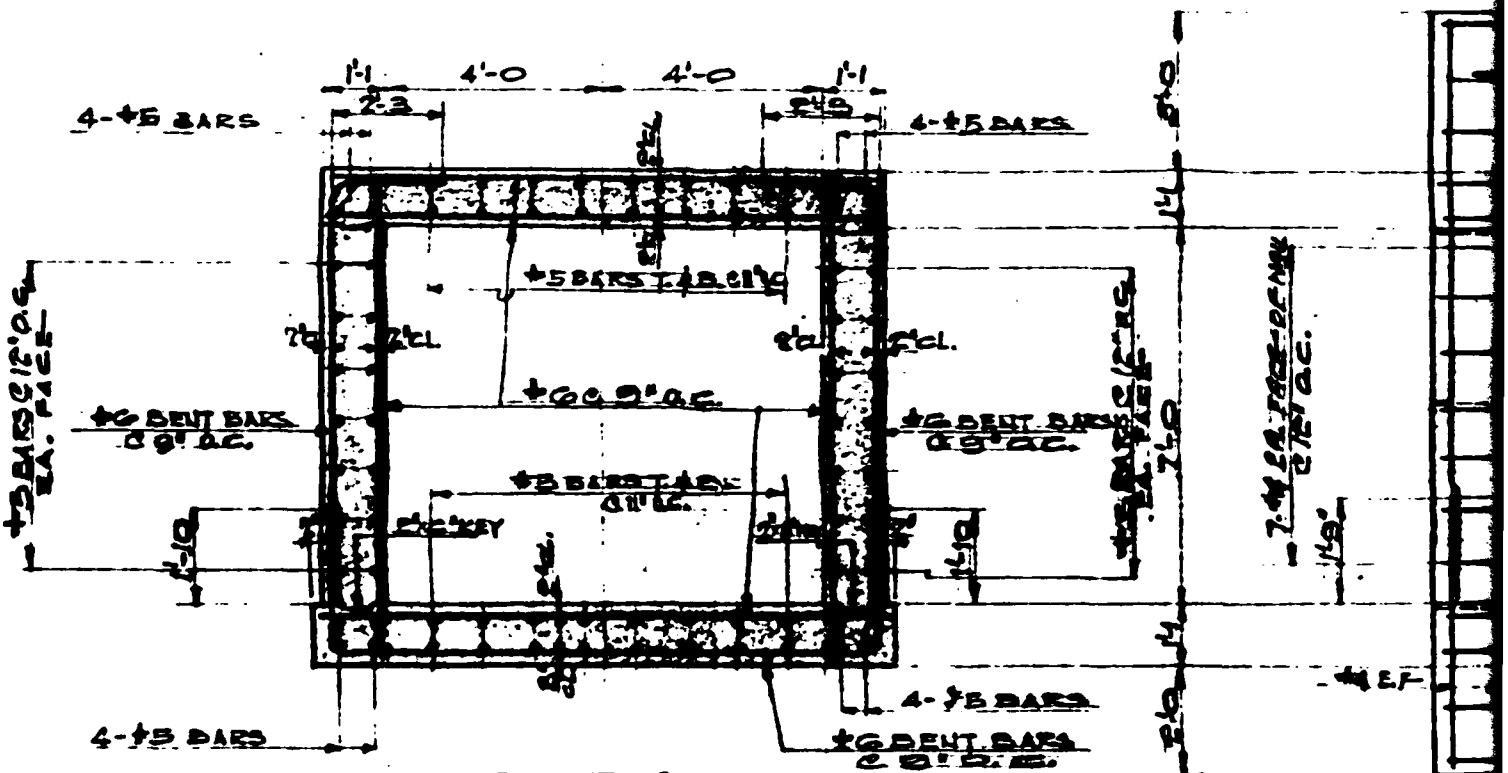
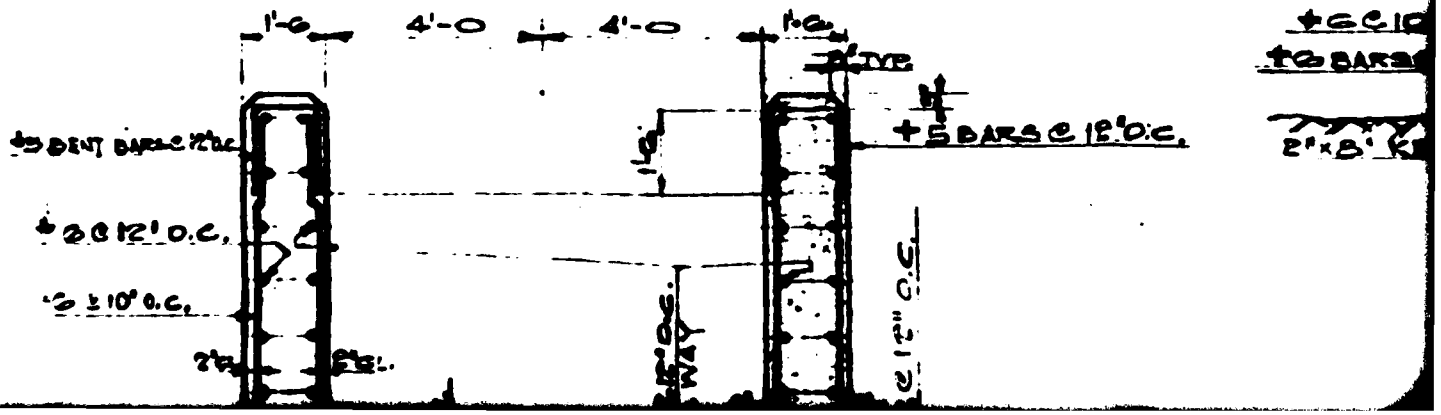

OMIT
10'-0

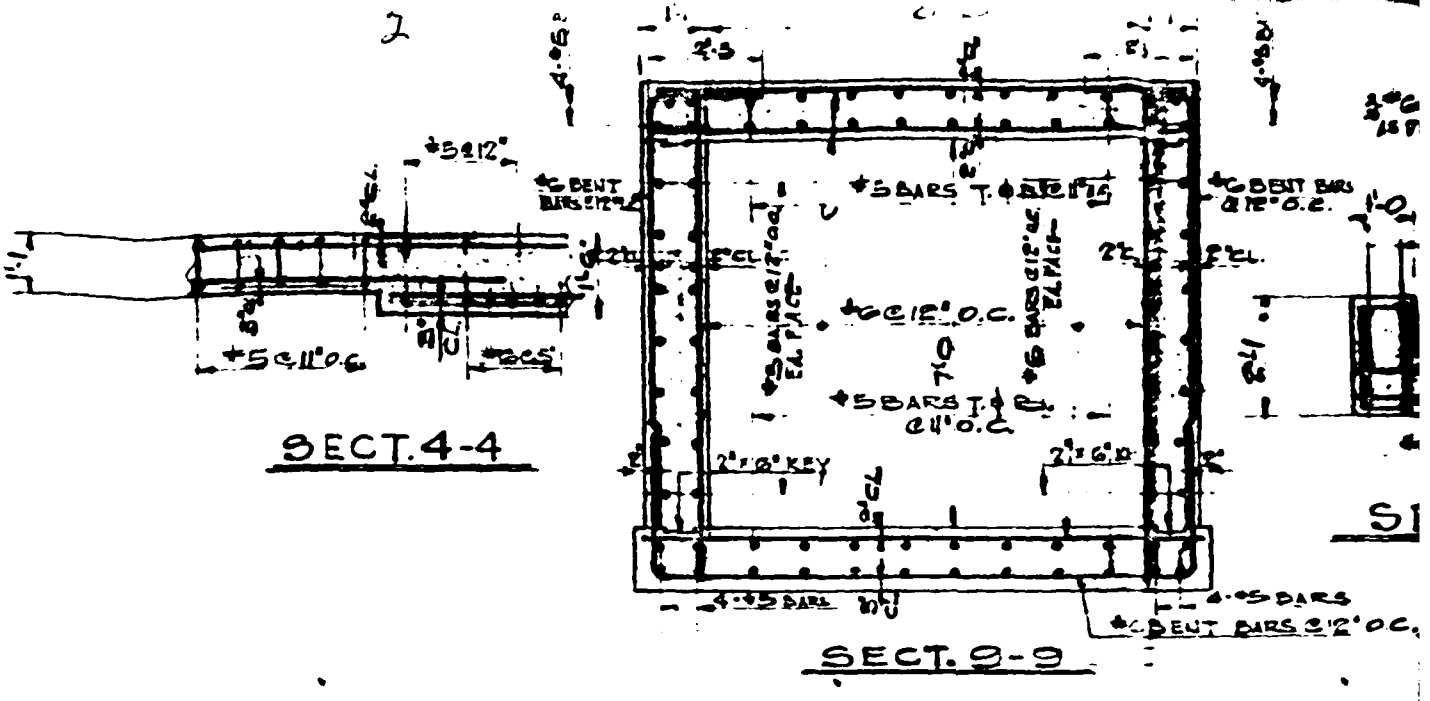


SECT. 1-1



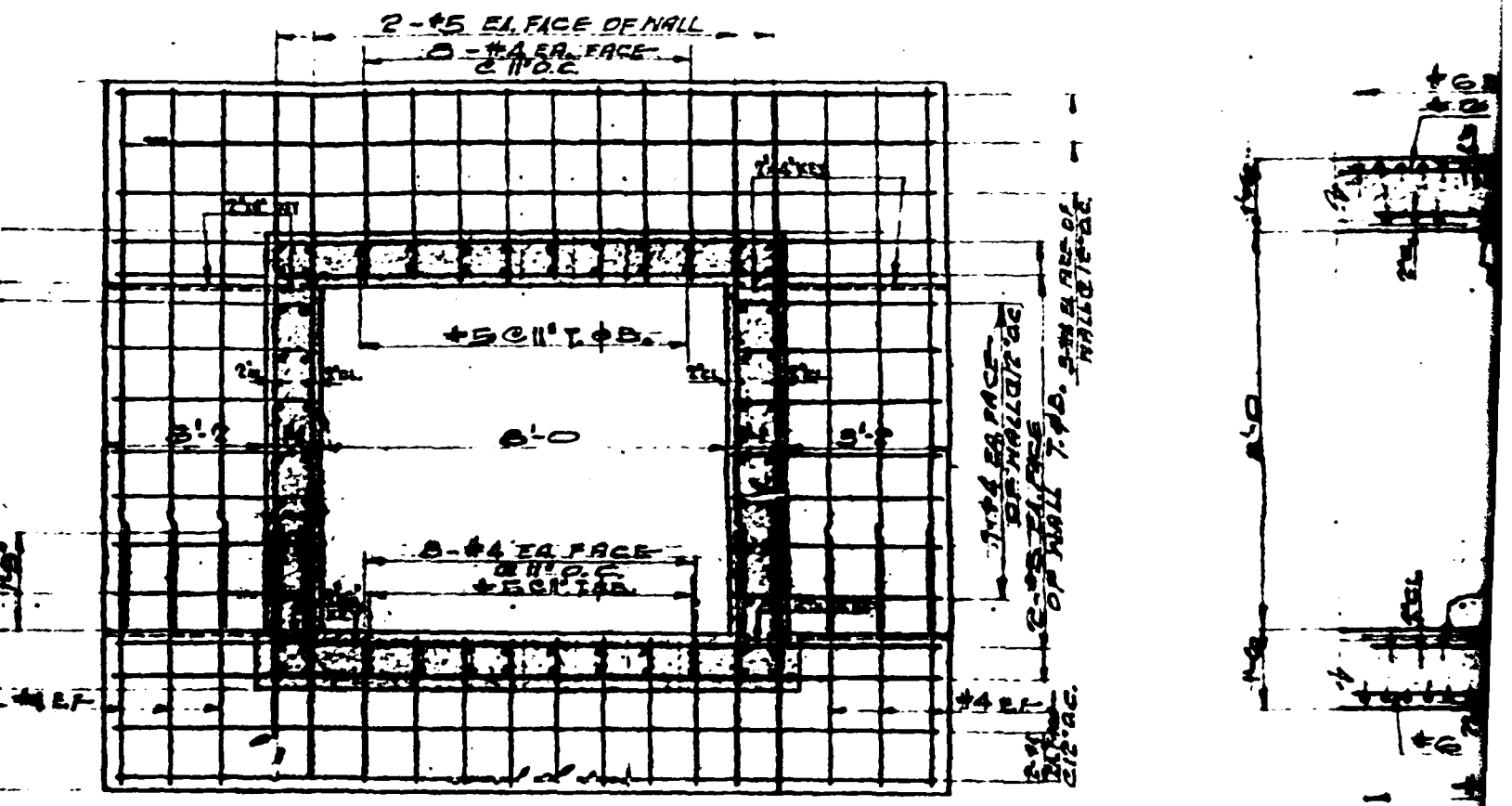
SECT. 2-2



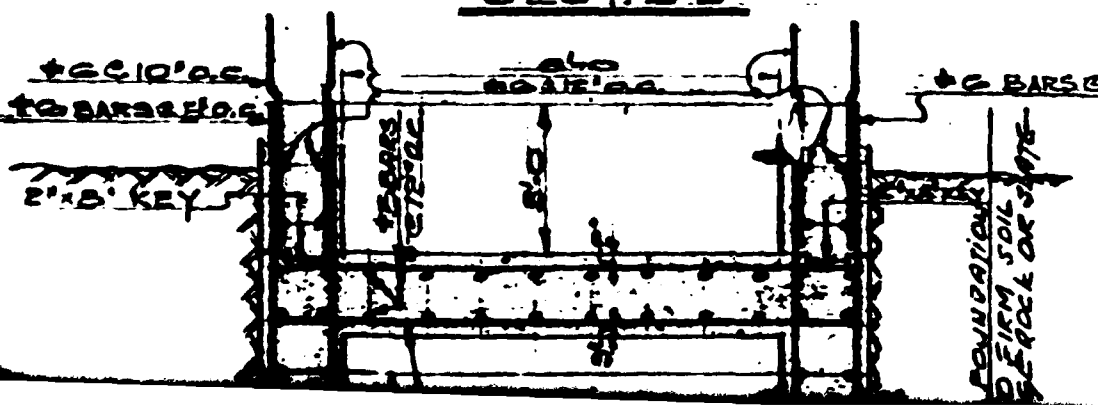


SECT. 4-4

SECT. 9-9

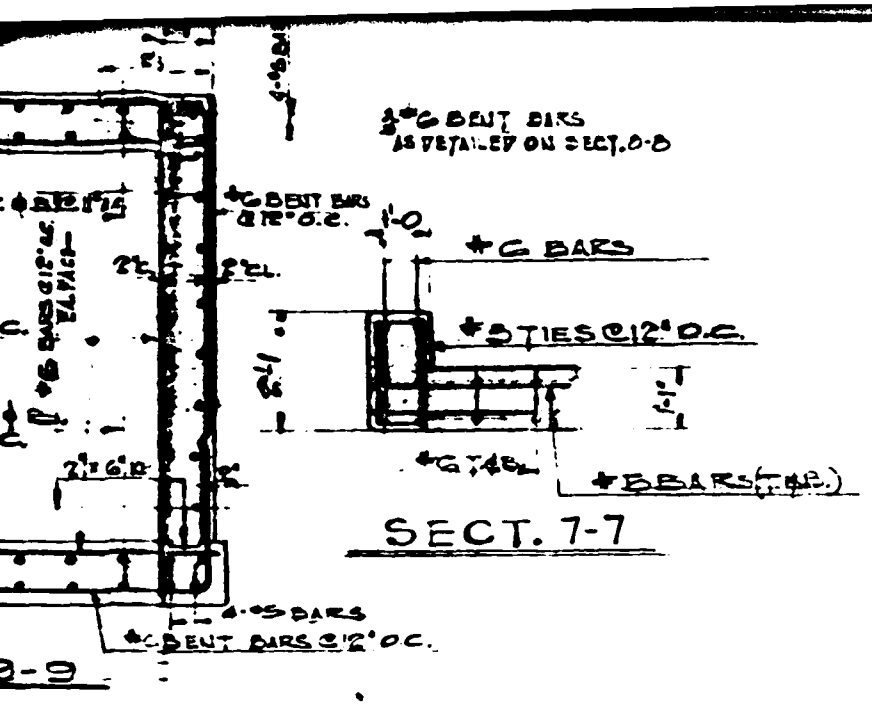


SECT. 5-5

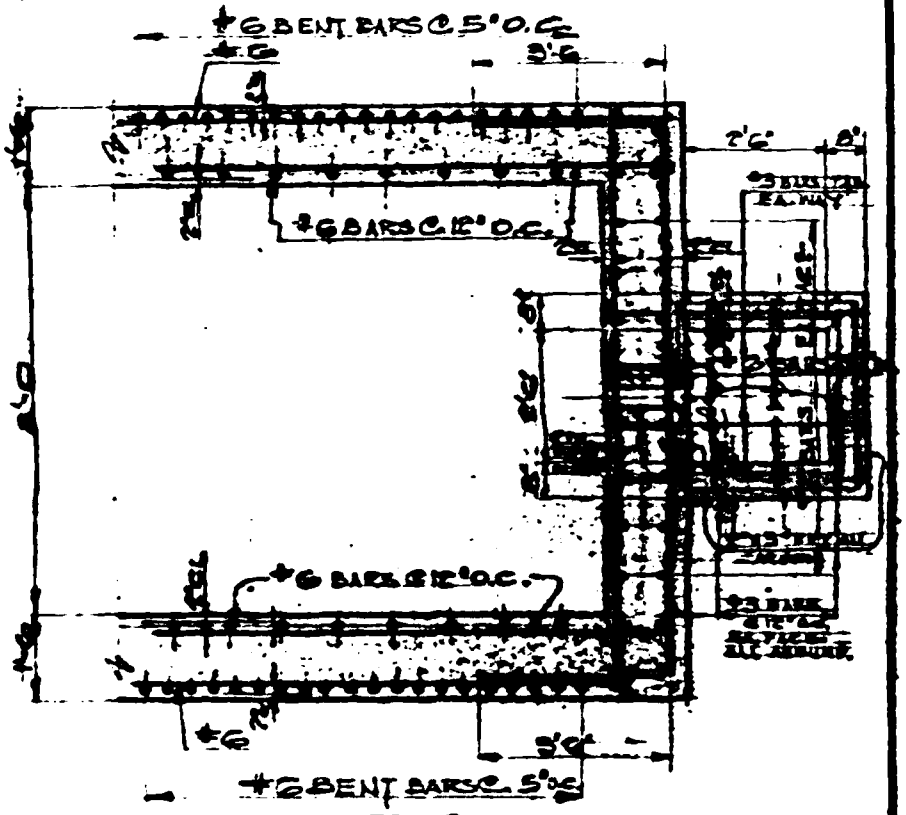


NOTES:

THE CONTRACTOR SHALL
COMPRESSION STRENGTH
ALL CEMENT SHALL BE PORTLA
WATER SHALL BE CLEAN FROM
THE AGGREGATES SHALL BE FREE
SHALL BE KEPT AT TEMPER
AFTER POURING. NO ADMI
PERMITTED.
REINFORCING STEEL SHALL
AND SHALL CONFORM TO A.S.
TO A.S.T.M. A-305.
REINFORCING STEEL SHALL
AND SHALL BE KEPT SO CL
ALL CONSTRUCTION JOINTS
ALL WORK SHALL BE DONE IN
AND IN ACCORDANCE WITH AP



SECT. 7-7

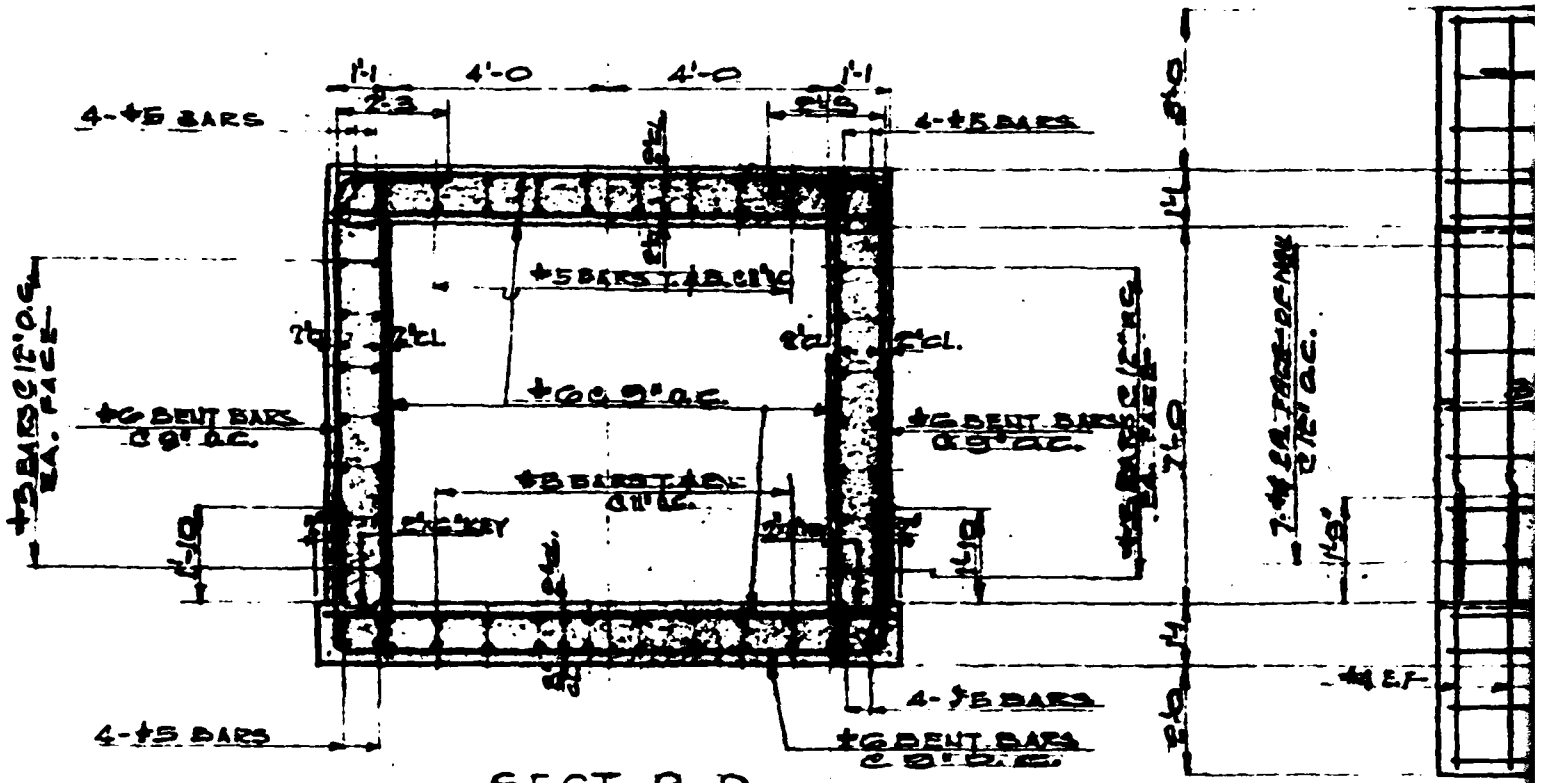


SECT. 8-8

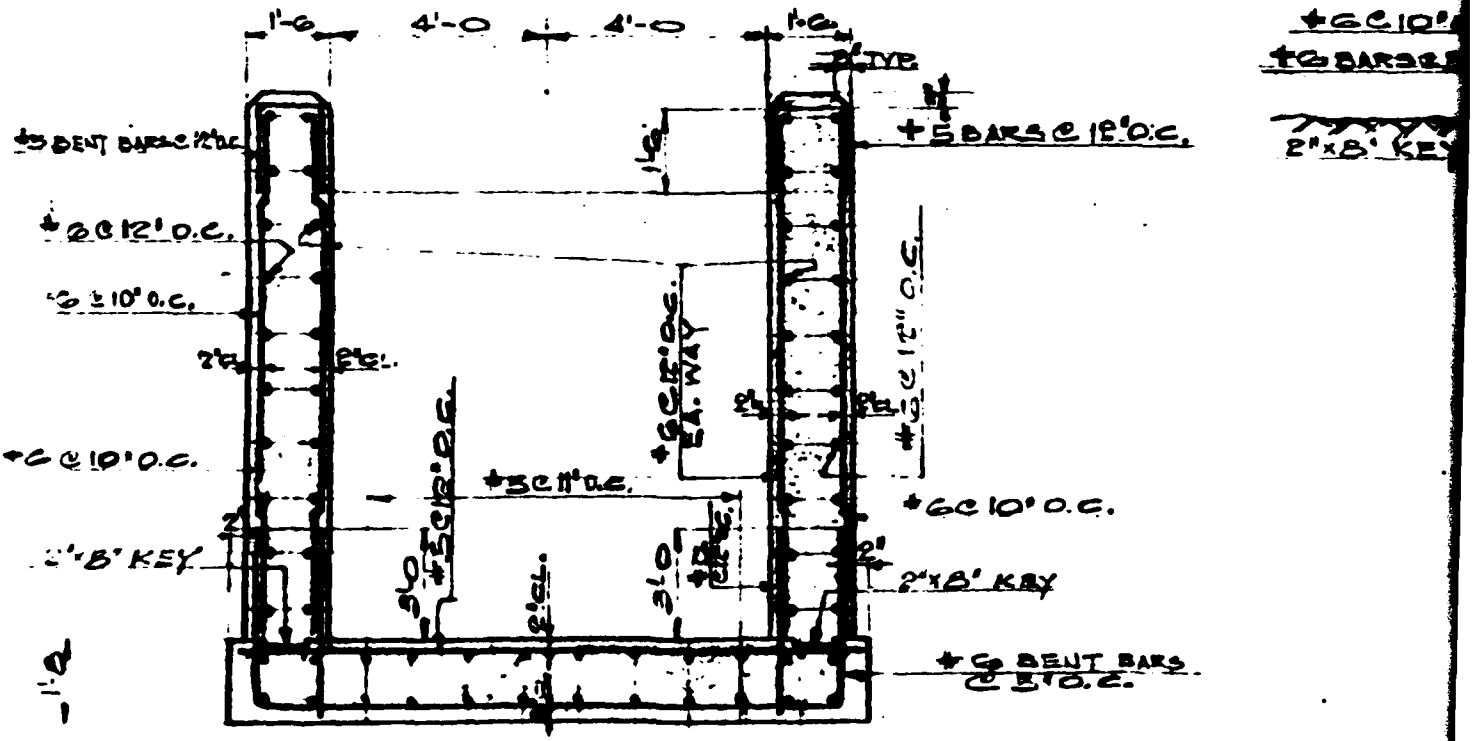
NOTES:

THE CONTRACTOR SHALL FURNISH CONCRETE WHICH SHALL DEVELOP COMPRESSION STRENGTH OF 3000 LBS. PER SQ. IN. WITHIN 28 DAYS.
ALL CEMENT SHALL BE PORTLAND AND SHALL CONFORM TO A.S.T.M. C-150 TYPE I.
WATER SHALL BE CLEAN FREE FROM OILS, ACIDS, SALTS OR OTHER INJURIOUS SUBSTANCES. THE AGGREGATES SHALL BE FREE OF FROM FROZEN LUMPS OR SNOW. THE CONCRETE SHALL BE KEPT AT TEMPERATURES OF 70° DEGREES F. FOR 72 HOURS AFTER POURING. NO ADMIXTURES TO PREVENT FREEZING SHALL BE PERMITTED.
REINFORCING STEEL SHALL BE NEW BILLET STOCK OF INTERMEDIATE GRADE AND SHALL CONFORM TO A.S.T.M. A-15. BARS SHALL BE DEFORMED TO CONFORM TO A.S.T.M. A-305.
REINFORCING STEEL SHALL BE FREE FROM SCALE, OIL AND STRUCTURAL DEFECTS AND SHALL BE KEPT SO ON THE JOB.
ALL CONSTRUCTION JOINTS SHALL BE KEYED AND DOWELED.
ALL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT BUILDING CODE AND IN ACCORDANCE WITH APPROVAL OF STATE OF NEW JERSEY.

SECT. 1-1

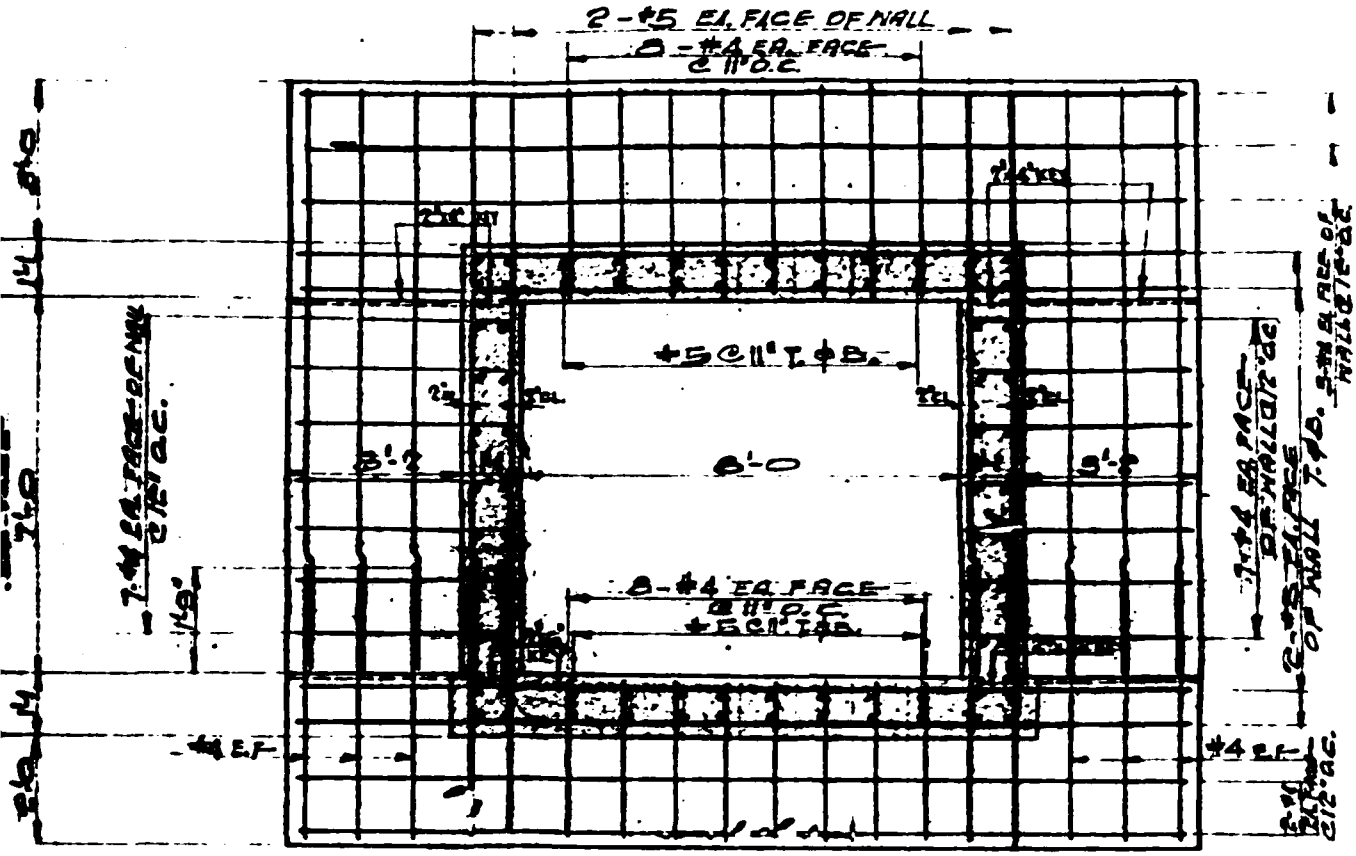


SECT. 2-2

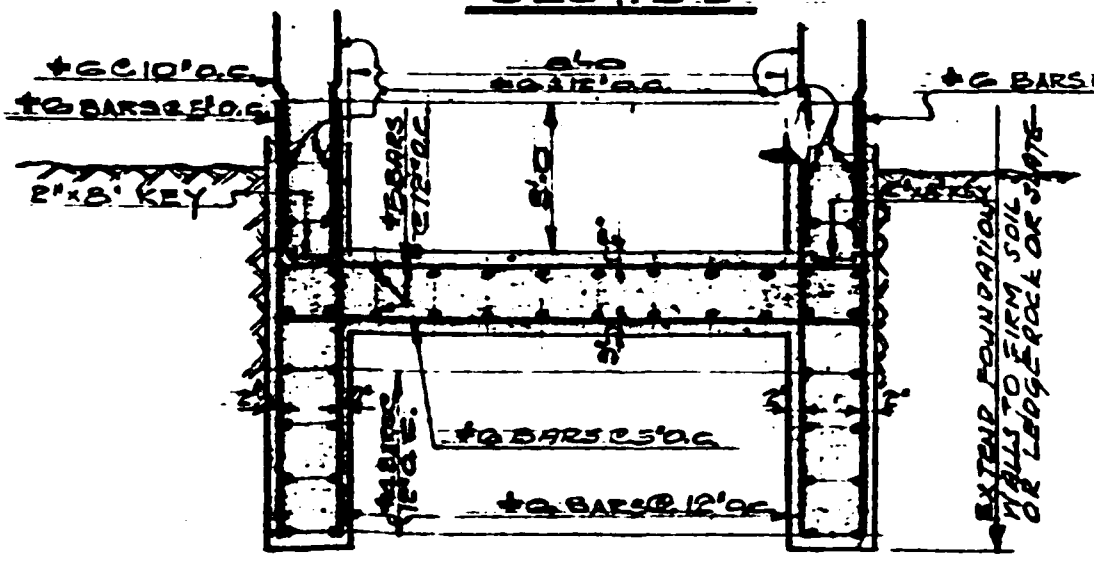


SECT. 3-3

SECT. 9-9



SECT. 5-5



SECT. 6-6

NOTES:

THE CONTRACT
COMPRESSION
ALL CEMENT SHALL
WATER SHALL BE C
THE AGGREGATES
SHALL BE KEPT
AFTER POURING
PERMITTED.
REINFORCING ST
AND SHALL CONFO
TO A.S.T.M. A-
REINFORCING ST
AND SHALL BE KE
ALL CONSTRUCTIO
ALL WORK SHALL
AND IN ACCORDANC

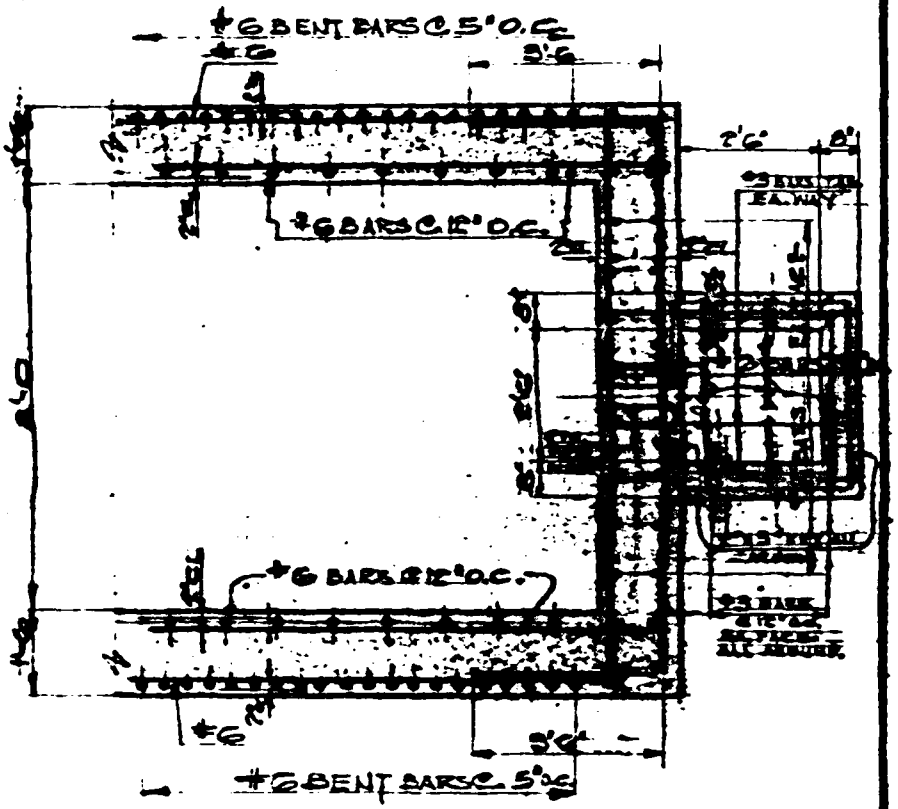
APPR

Dept. Envi
Protec
Div. Water
Bur. Water

Robt. L.

#4 BARS
#6 BENT BARS @ 12" O.C.

9



SECT. 8-8

NOTES:

THE CONTRACTOR SHALL FURNISH CONCRETE WHICH SHALL DEVELOP COMPRESSION STRENGTH OF 3000 LBS. PER SQ. IN. WITHIN 28 DAYS.
ALL CEMENT SHALL BE PORTLAND AND SHALL CONFORM TO A.S.T.M. C-150 TYPE I.
WATER SHALL BE CLEAN FREE FROM OILS, ACIDS, SALTS OR OTHER INJURIOUS SUBSTANCES.
AGGREGATES SHALL BE FREE OF FORM FROZEN LUMPS OR SNOW. THE CONCRETE SHALL BE KEPT AT TEMPERATURE OF 70° DEGREES F. FOR 72 HOURS AFTER POURING. NO ADMIXTURES TO PREVENT FREEZING SHALL BE PERMITTED.
REINFORCING STEEL SHALL BE NEW BILLET STOCK OF INTERMEDIATE GRADE AND SHALL CONFORM TO A.S.T.M. A-15, BARS SHALL BE DEFORMED TO CONFORM TO A.S.T.M. A-305.
REINFORCING STEEL SHALL BE FREE FROM SCALE, OIL AND STRUCTURAL DEFECTS AND SHALL BE KEPT SO ON THE JOB.
ALL CONSTRUCTION JOINTS SHALL BE KEYED AND DOWELLED.
ALL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT BUILDING CODE AND IN ACCORDANCE WITH APPROVAL OF STATE OF NEW JERSEY.

FILE

Permit Appn. No. 615
Affixed JUN 30 1972
Dept. Environmental Protection
Div. Water Resources
Bur. Water Control

Robert L. Hartman

JOHN B. AICHER ASSOCIATES
MORRIS ENGINEERS, INC.
BY
LEDGEWOOD-CONSULT. ENGINEERS-N.J.

UNAUTHORISED ENCROACHMENT
NO: E-886
JACKSONBURG CREEK, TWP. OF BLAIRSTOWN
WARREN COUNTY, STATE OF NEW JERSEY

LICENSE NO. 10814
DRAWN BY LL MAY 31, 1972
APR. 28, 1972
MAY 30, 1972
SCALE: 1" = 1'-0"

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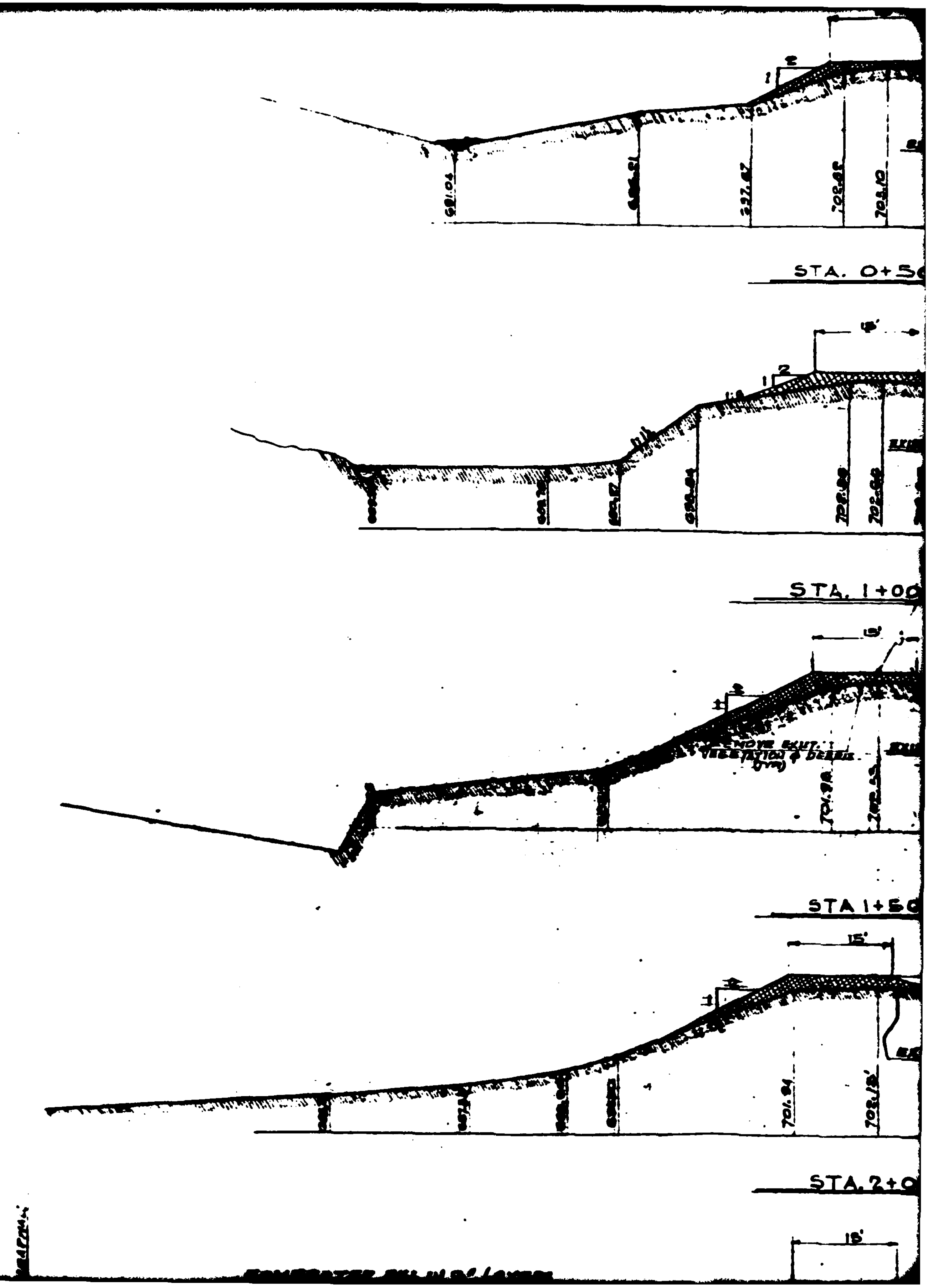
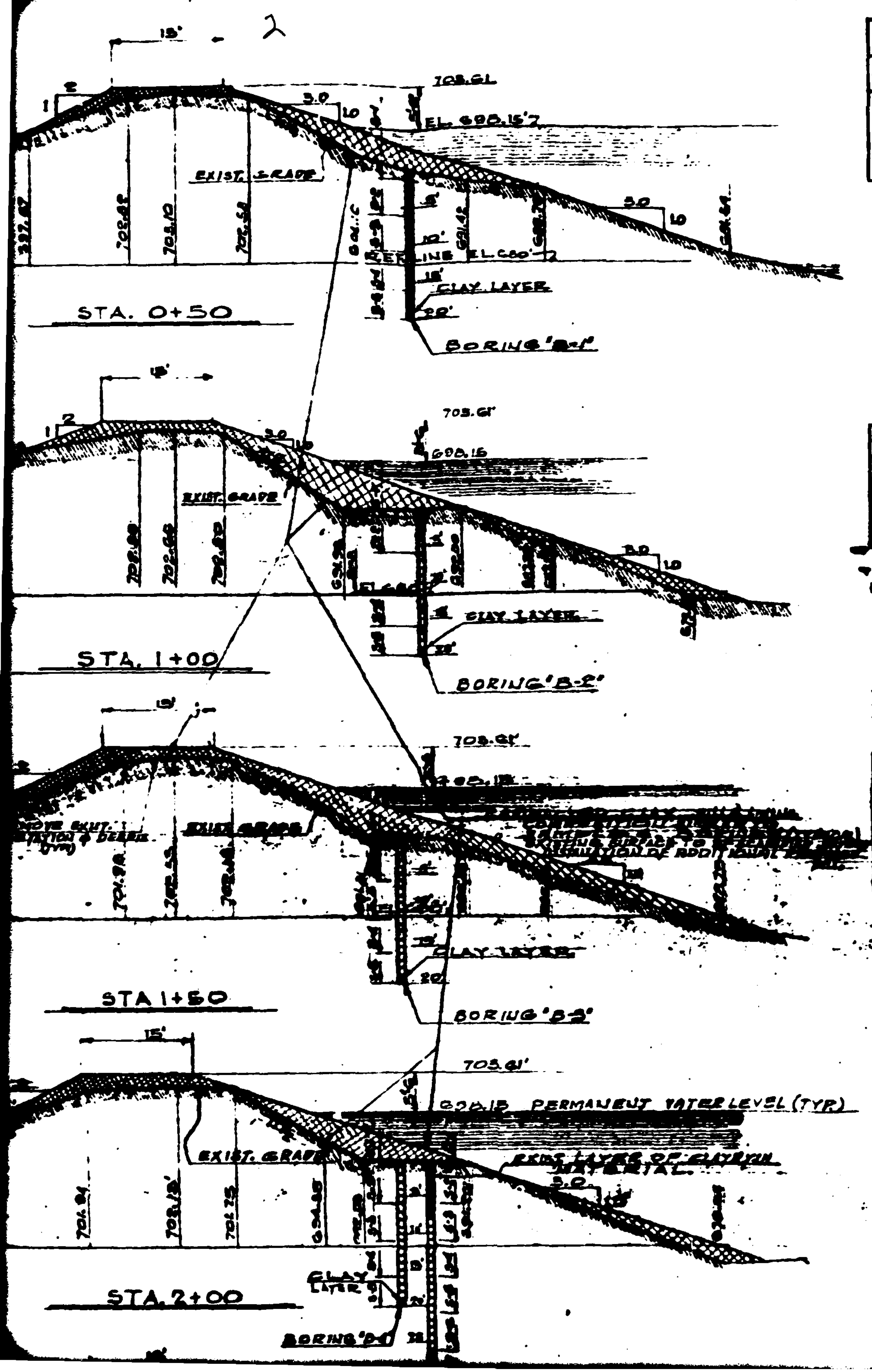


STA. 0+5
15'
STA. 1+00
15'
701.96
STA 1+5
15'
701.94
702.15'
STA. 2+0
15'



BORI...	
SAMPLE	SOIL CLASS... BY JERSEY, ...
S-1	YEL-BRN. CLAY, TRI...
S-2	YEL.-GRAY, CRS.-FINE ...
S-3	YEL-GRAY, CRS.-FINE ...
S-4	YEL.-GRAY, CRS.-FINE ...
S-5	GRAY, CLAY, SOME ...

BOR...	
SAMPLE	SOIL CLASSIFICATI... JERSEY DR...
S-1	GRY-BRN. CLAY ...
S-2	GRY-YELN, MEDIUM ...
S-3	GRY. MEDIUM-FINE ...
S-4	GRY. CRS.-FINE ...
S-5	GRAY. CLAY, TRAC...

BO...	
SAMPLE	SOIL CLASSIFICA... BY JERSEY D...
S-1	GRAY-BRN. CR...
S-2	GRAY, MEDIUM ...
S-3	YEL.-GRAY MED.-...
S-4	GRAY. CRS.-FI...
S-5	GRAY CLAY, ...

BO...	
SAMPLE	SOIL CLASSIFIC... ANALYZED ...
S-1	YELLOW-BRN AND ... CLAYEY SILT, ...
S-2	GRY. CRS.-FI...
S-3	YEL.GRY ...
S-4	GRAY SILTY CL...
S-5	GRAY CRS.-FINE...

BO...	
SAMPLE	SOIL CLASSIFI... ANALYZED BY ...

3

BORING 'B-1'

SAMPLE	SOIL CLASSIFICATION (SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING CORP.)
S-1	YEL-BRN. CLAY, TRACE FINE SAND, TRACE FINE GRAVEL.
S-2	YEL.-GRAY. CRS.-FINE SAND, LITTLE MED.-FINE GRAVEL, TRACE SIL
S-3	YEL-GRAY. CRS.-FINE SAND, TRACE FINE GRAVEL, TRACE SIL
S-4	YEL.-GRY. CRS.-FINE SAND, TRACE FINE GRAVEL, TRACE SIL
S-5	GRY. CLAY, SOME MEDIUM-FINE GRAVEL, TRACE C-FINE SAN

BORING 'B-2'

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING CORP.)
S-1	GRY-BRN. CLAY, TRACE CRS.-FINE SAND, LITTLE SILT
S-2	GRY-YELW. MEDIUM-FINE GRAVEL, SOME C-FINE SAND, TRACE SI
S-3	GRY. MEDIUM-FINE GRAVEL, TRACE C-FINE SAND.
S-4	GRY. CRS.-FINE SAND, LITTLE CLAYEY SILT, LITTLE MEDIUM-FINE GRAVEL
S-5	GRY. CLAY, TRACE COURSE-FINE SAND, TRACE MED.-FINE GRAV

BORING 'B-3'

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING CORP.
S-1	GRAY-BRN. CRS.-FINE SAND, LITTLE MED.-FINE GRAVEL, LITTLE CLAYEY SILT.
S-2	GRAY. MEDIUM - FINE GRAVEL.
S-3	YEL.-GRAY MED-FINE GRAVEL, TRACE CRS.-FINE SAND
S-4	GRAY. CRS.-FINE SAND, SOME (-) CLAYEY SILT, LITTLE MED.-FINE GRAVEL
S-5	GRAY CLAY, LITTLE FINE SAND, LITTLE MED-FINE GRAVEL

BORING 'B-4'

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING CORP.
S-1	YELOR-BRN AND GRAY, CRS.-FINE SAND, LITTLE-CLAYEY SILT, LITTLE (-) MED.-FINE GRAVEL (FILL)
S-2	GRY. CRS.-FINE SAND, SOME MED.-FINE GRAVEL, TRACE SILT, (FILL).
S-3	YEL. GRY. FINE-FINE SAND, TRACE FINE GRAVEL, TRACE SILT.
S-4	GRAY SILTY CLAY, TRACE FINE GRAVEL, LITTLE-CRS.-FINE SAND.
S-5	GRAY CRS.-FINE SAND, SOME MED.-FINE GRAVEL LITTLE CLAYEY SILT.

BORING 'B-5'

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING CORP.

FILE

Dwg. Appr. No. 615
APPROVED JUN 30 1972
Dept. Environmental Protection
Div. Water Resources
Bur. Water Control

Robt L. Hardman

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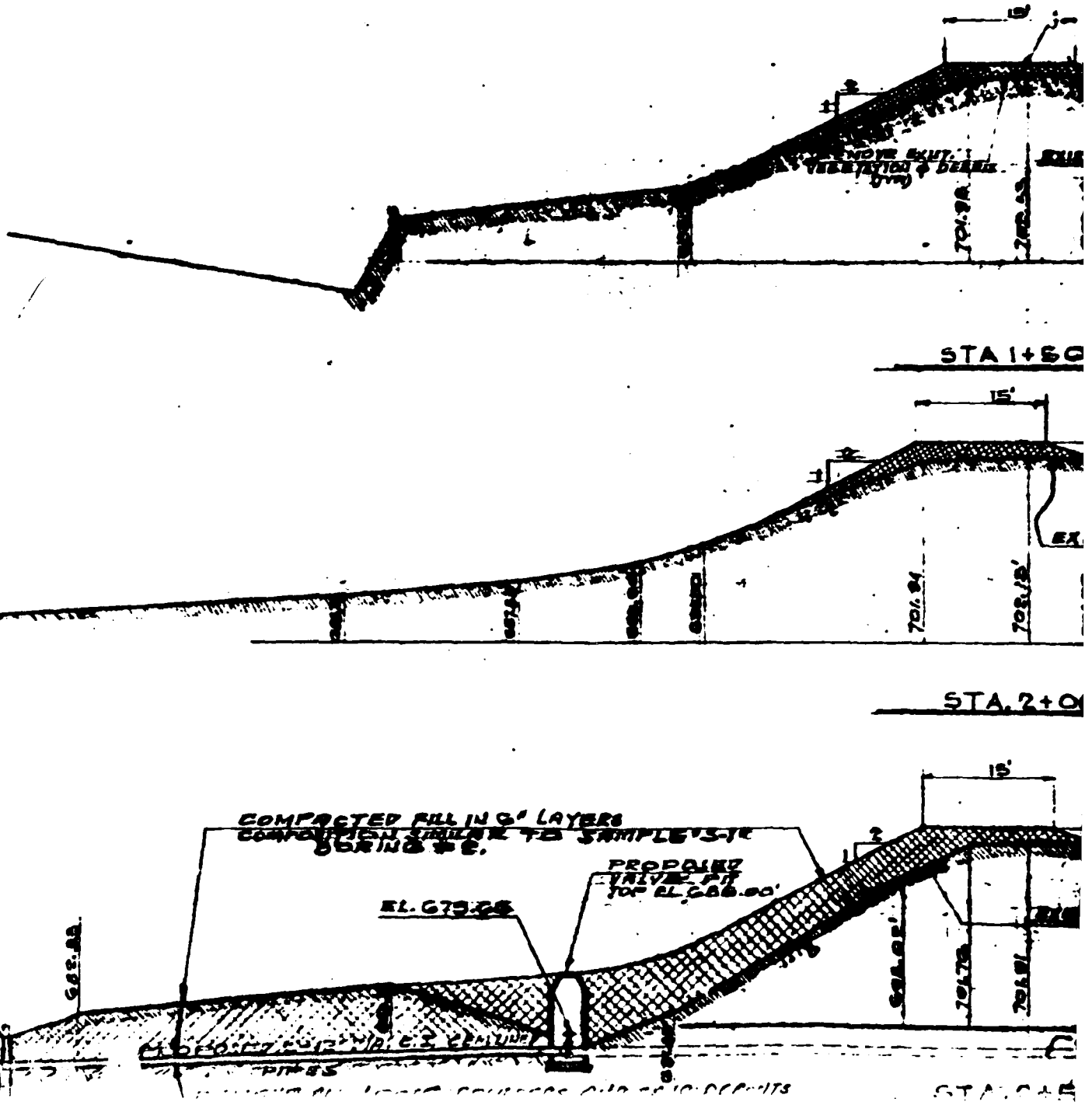
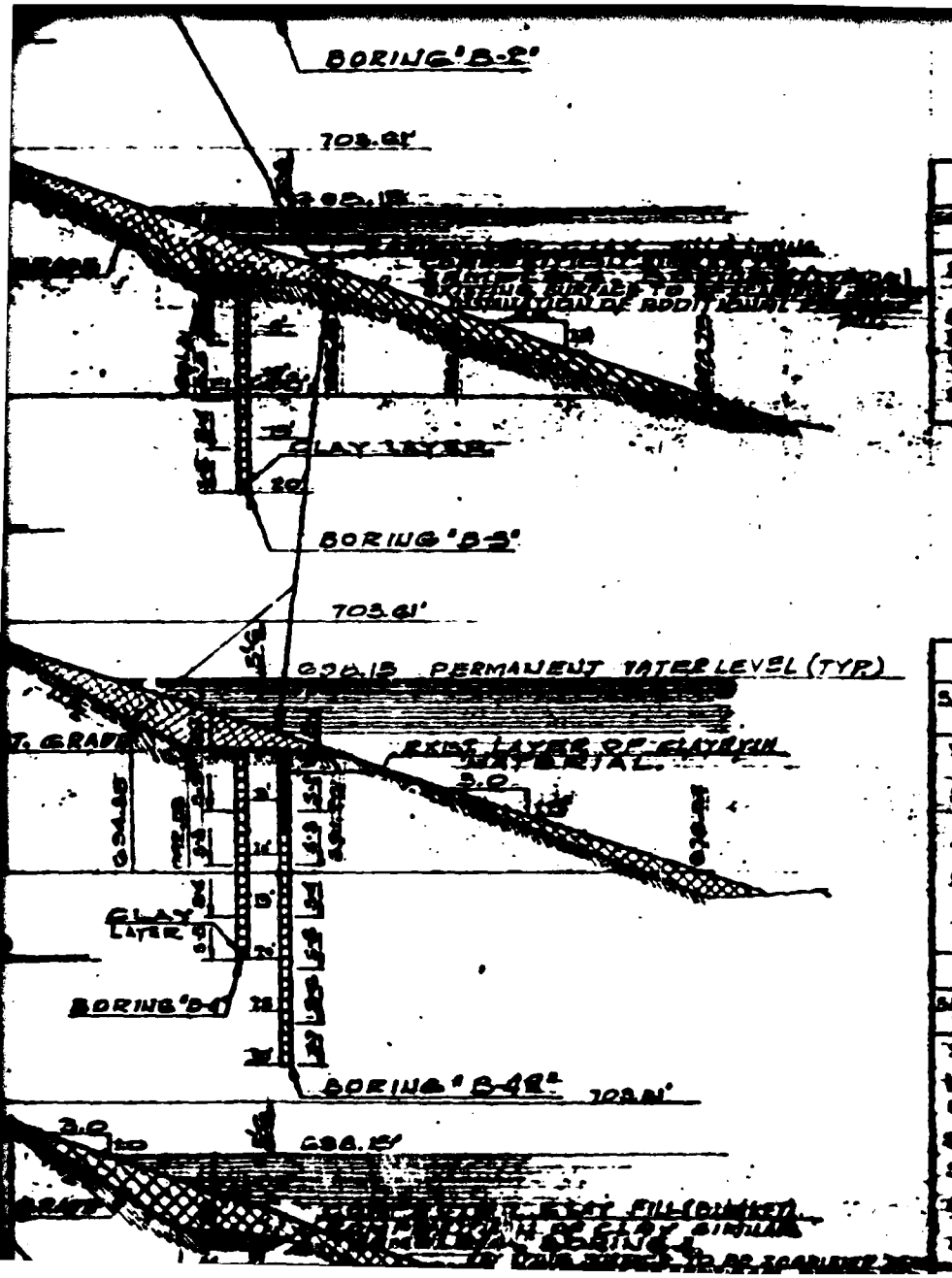

STA 1+50
15'
STA. 2+0
15'
COMPACTED FILL IN 6" LAYERS
PROPOSED
VALVE PIT
EL. 679.68
PROPOSED HEADWALL
PIPES



BORING 'B-3'

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING
B-1	GRAY - BRN. CRSE - FINE SAND, LITTLE MED - FINE ... LITTLE CLAYEY ...
B-2	GRAY, MEDIUM - FINE GRAVEL ...
B-3	YEL. - GRAY MED - FINE GRAVEL, TRACE CRS. ...
B-4	GRAY, CRS. - FINE SAND, SOME (-) CLAYEY ... LITTLE MED. FINE ...
B-5	GRAY CLAY, LITTLE FINE SAND, LITTLE ... GRAY

BORING 'B-4

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING
B-1	YELLOW - BRN AND GRAY, CRS. - FINE SAND, LI ... CLAYEY SILT, LITTLE (+) MED. - FINE GRAVEL (F ...
B-2	GRAY, CRS. - FINE SAND, SOME MED. - FINE GRAV ... SILT, (FILL).
B-3	YEL. GRY. CRS. - FINE SAND, TRACE FINE GRAV ... TRACE SI ...
B-4	GRAY SILTY CLAY, TRACE FINE GRAVEL, LIT ... CRS. - FINE SA ...
B-5	GRAY CRS. - FINE SAND, SOME MED. - FINE ... LITTLE CLAYEY ...

BORING 'B-4

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING
B-1	YEL - GRY CLAY, LITTLE CRS. - FINE ... TRACE FINE GRAVEL, (FILL)
B-2	YEL - GRY CLAY, LITTLE CRS. - FINE SAND, ...
B-3	YEL - GRY MED. - FINE GRAVEL, SOME CRS. - FINE SAND ... LITTLE CLAYEY ...
B-4	...
B-5	...
B-6	...
B-7	...

M

LEDGE

UNAU

...Y, TRACE COARSE-FINE SAND, TRACE ...

BORING 'B-3'

...SIFICATION - SAMPLES TAKEN & ...
...BY DRILLING & BORING CORP.

...REL. CRSE - FINE SAND, LITTLE MED-FINE GRAVEL, LITTLE CLAYEY SILT.
...MEDIUM - FINE GRAVEL.
...Y MED - FINE GRAVEL, TRACE CRS. - FINE SAND.
...RS. - FINE SAND, SOME (-) CLAYEY SILT, LITTLE MED. - FINE GRAVEL.
...LAY, LITTLE FINE SAND, LITTLE MED-FINE GRAVEL.

BORING 'B-4'

...SIFICATION - SAMPLES TAKEN & ...
...BY JERSEY DRILLING & BORING CO.
...AND GRAY, CRS. - FINE SAND, LITTLE - (WITH TR.) MED. - FINE GRAVEL (FILL)
...SAND, SOME MED. - FINE GRAVEL, TRACE SILT, (FILL).
...FINE SAND, TRACE FINE GRAVEL, TRACE SILT.
...CLAY, TRACE FINE GRAVEL, LITTLE CRS. - FINE SAND.
...FINE SAND, SOME MED. - FINE GRAVEL, LITTLE CLAYEY SILT.

BORING 'B-4A'

...FICATION - SAMPLES TAKEN & ...
...BY JERSEY DRILLING & BORING CORP.
...LAY, LITTLE CRS. - FINE SAND, ...
...LITTLE CRS. - FINE SAND, ...
...& LITTLE CLAYEY SILT.

BORING 'B-5'

...ICATION - SAMPLES ...
...BY J.J. DRILLING ...
...LAY, LITTLE CRS. - FINE SAND, TRACE ...
...LITTLE MED. - FINE GRAVEL, TRACE ...
...SILT, LITTLE MED. - FINE GRAVEL, TRACE ...
...CLAYEY SILT.

FILE

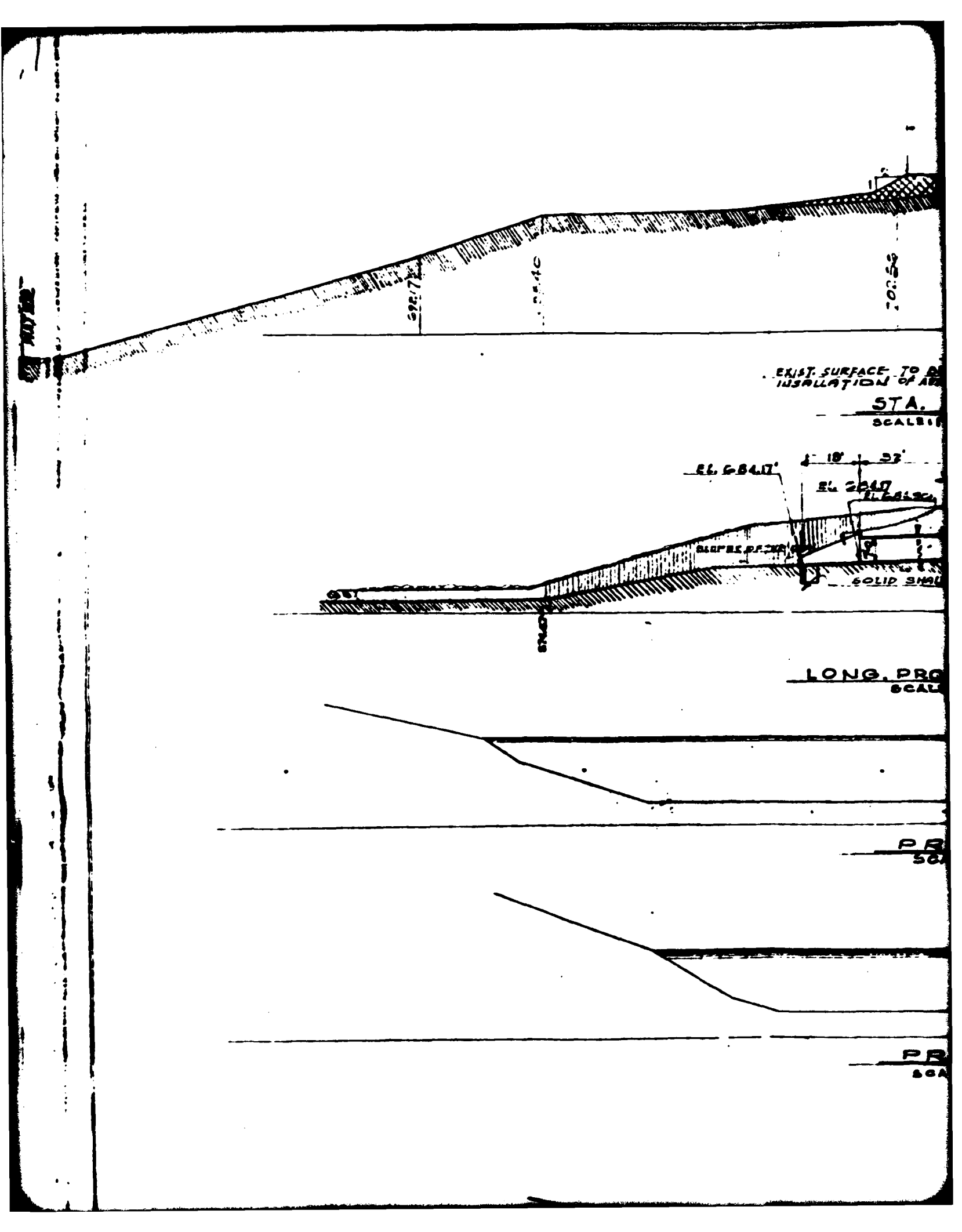
Dep't Appl. No. 615
APPROVED JUN 30 1972
Dept. Environmental Protection
Div. Water Resources
Bur. Water Control

Robert L. Hartman

MORRIS ENGINEERS, INC.
BY
LEDGEWOOD, CONSULT. ENGRS, N.J.

UNAUTHORISED ENCROACHMENT
NO:- E-356
JACKSONBURG CREEK, TWP. OF BLAIRSTOWN
WARREN COUNTY, STATE OF NEW JERSEY
LICENSE No: 10614
DRAWN BY: L.A. CHECKED BY L.A.

5 6


EXIST. SURFACE TO
INSTALLATION OF
STA.
SCALE
EL. 6841'
18'
33'
SLOPES
SOLID
LONG. PRO
SCAL
PR
SC
PR

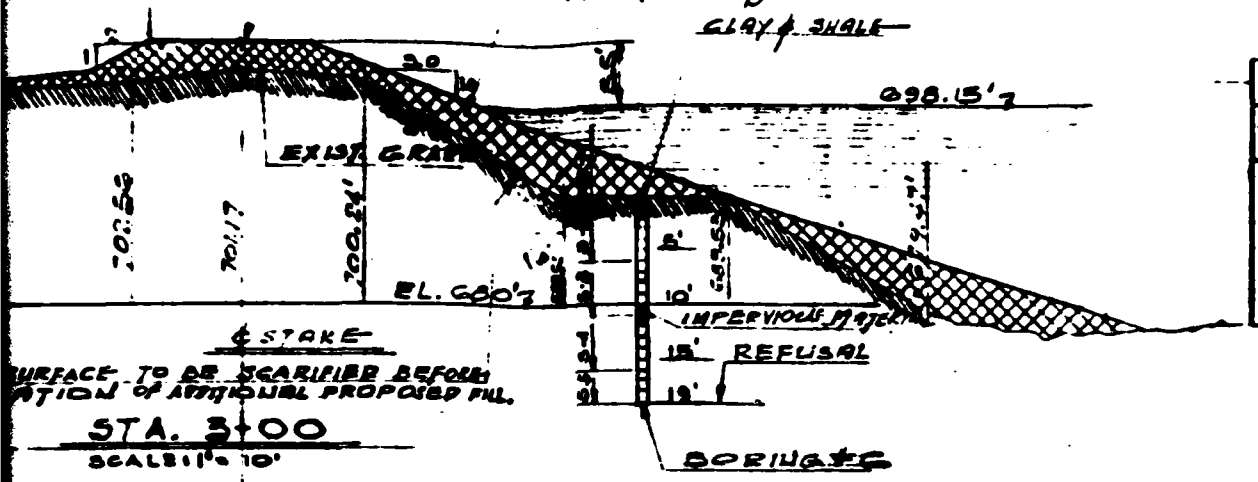
2

EL. 703.61

15'

CLAYISH LOAM FILL (BLANKET)

CLAY & SHALE



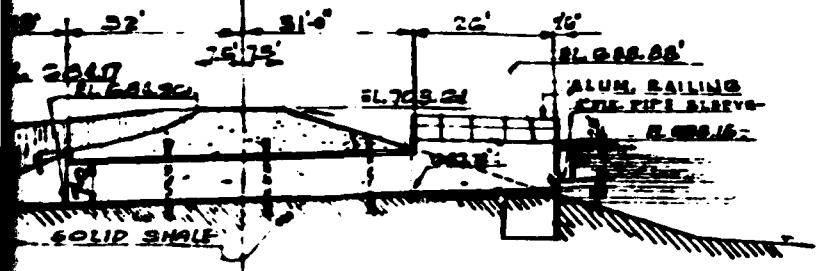
BOR	
SAMPLE	BOIL CLASSIFICATI ANALYZED BY ERS
S-1	YEL. CLAY & S
S-2	GRAY MED.-FINE SILT, TRACE FI
S-3	YELLOW-GRAY MEDIUM-FINE
S-4	GRAY MED.-FINE SILT, LITTLE ME
S-5	GRAY DECOMPO

& STAKE

URFACE TO BE SCARIFIED BEFORE ATION OF ADDITIONAL PROPOSED FILL.

STA. 3+00

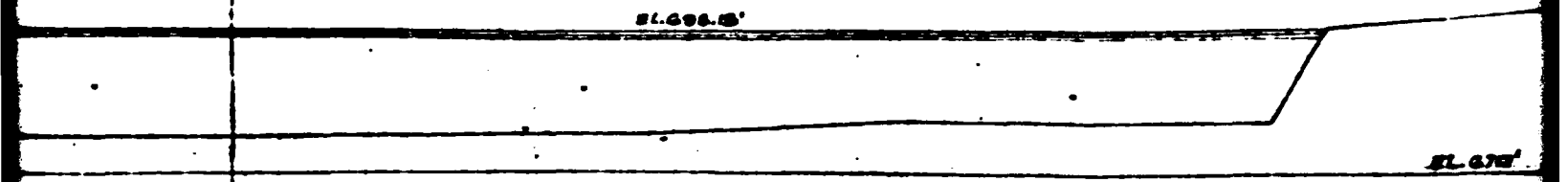
SCALE: 1" = 10'



EL. 670'

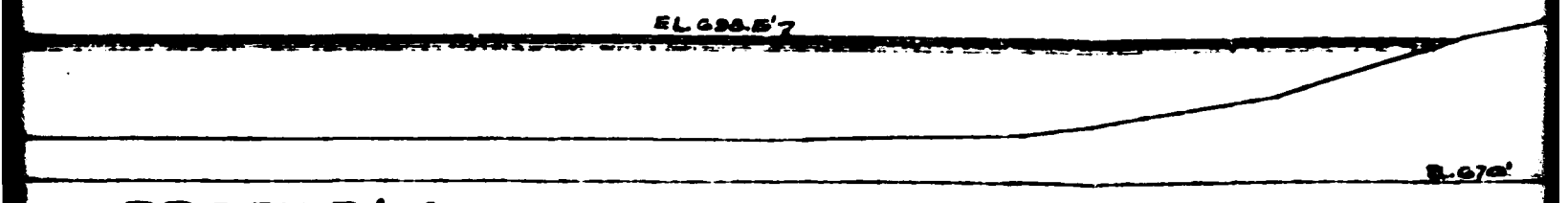
NG. PROFILE THRU SPILLWAY

SCALE: 1" = 20'



PROFILE 'B'

SCALE: 1" = 2[illegible]

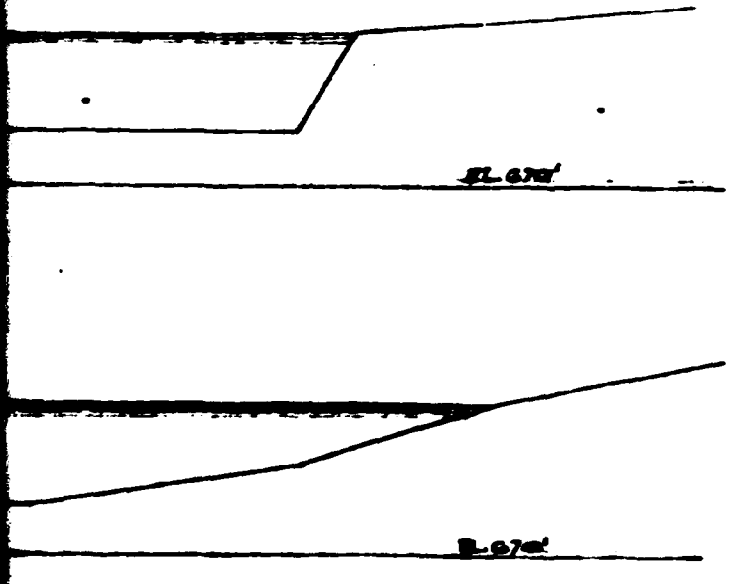


PROFILE 'C'

SCALE: 1" = 20'

BORING No 6

SAMPLE	SOIL CLASSIFICATION - SAMPLES TAKEN & ANALYZED BY JERSEY DRILLING & BORING CORP.
S-1	YEL. CLAY & SHALE
S-2	GRAY MED.-FINE SAND, LITTLE CLAYISH SILT, TRACE FINE GRAVEL.
S-3	YELLOW-GRAY CLAYISH SILT, SOME MEDIUM-FINE GRAVEL, TRACE CRS.-FINE SAND.
S-4	GRAY MED.-FINE SAND, LITTLE CLAYISH SILT, LITTLE MED.-FINE GRAVEL.
S-5	GRAY DECOMPOSED SHALE



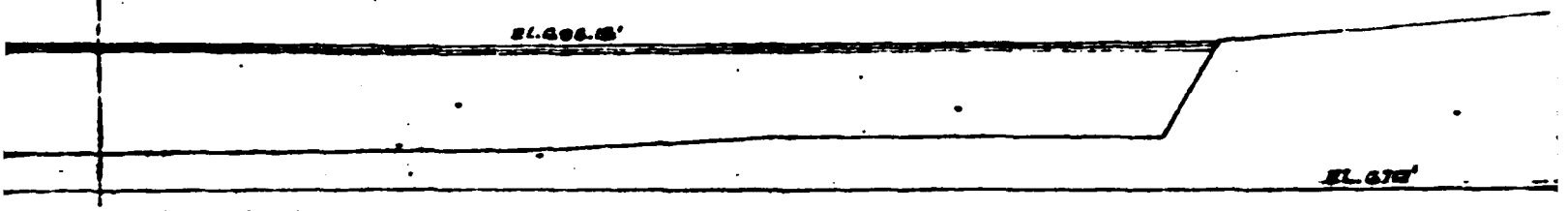
FILE

615

JUN 30 1972

SOLID SM
LONG. PR
SCA

ROFILE THRU SPILLWAY
ALE: 1"=20'



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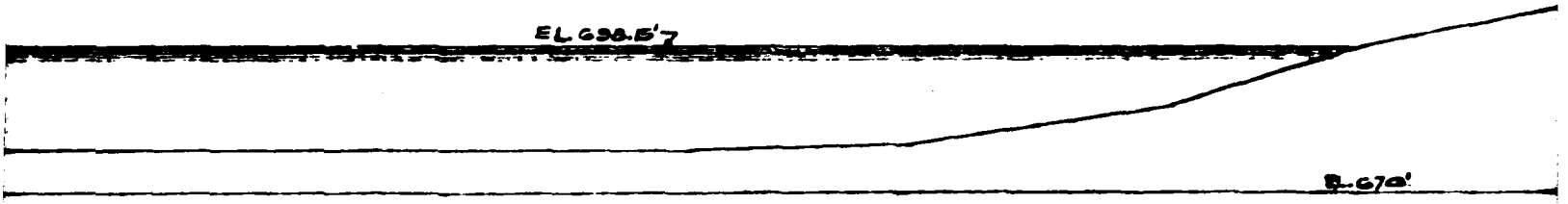
SCALE: 1"=20'



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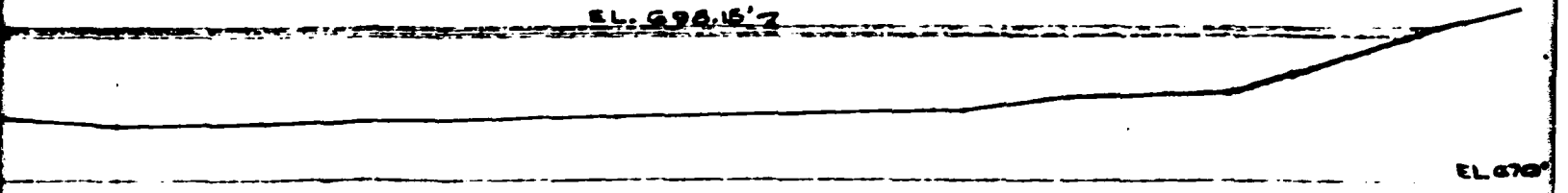
SCALE: 1"=20'



PROFILE 'D'
SCALE: 1"=20'

5

FILE

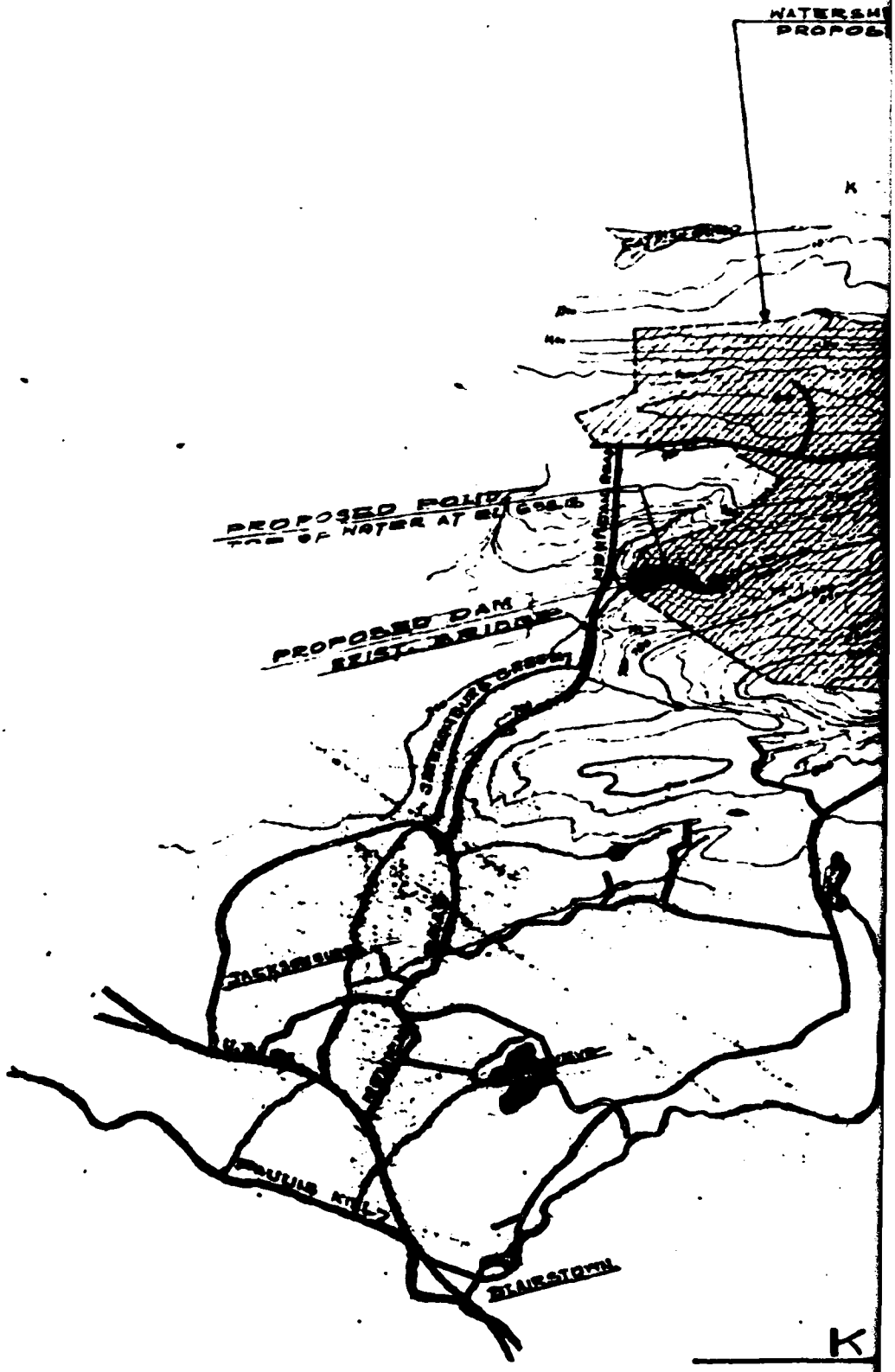
615

JUN 30 1972

Robert A. Morris

MORRIS ENGINEERS, INC.
BY
LEDGEWOOD-CONSULT. ENGR'S.-N.J.
UNAUTHORISED ENCHROACHMENT
NO:- E-356
JACKSONBURG CREEK, TWP OF BLAIRSTOWN
WARREN COUNTY, STATE OF NEW JERSEY
LICENSE NO. 10814
DRAWN BY LA

16



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APPLICATION

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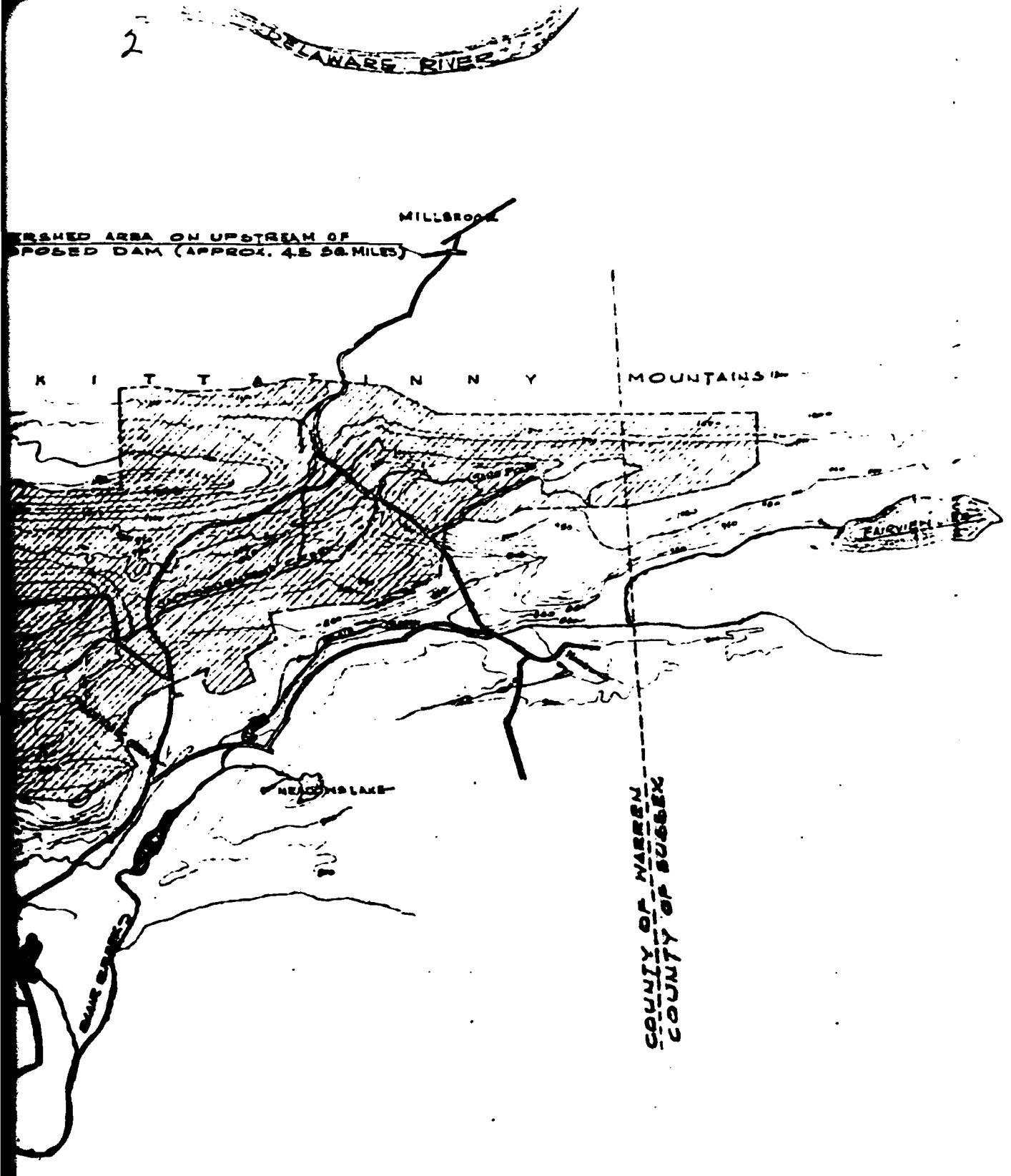


KEY MAP

SCALE: 1" = 2000 FT.

FOR DAM ON JACKSONBURG CREEK

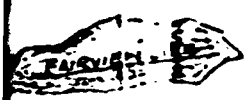
BY

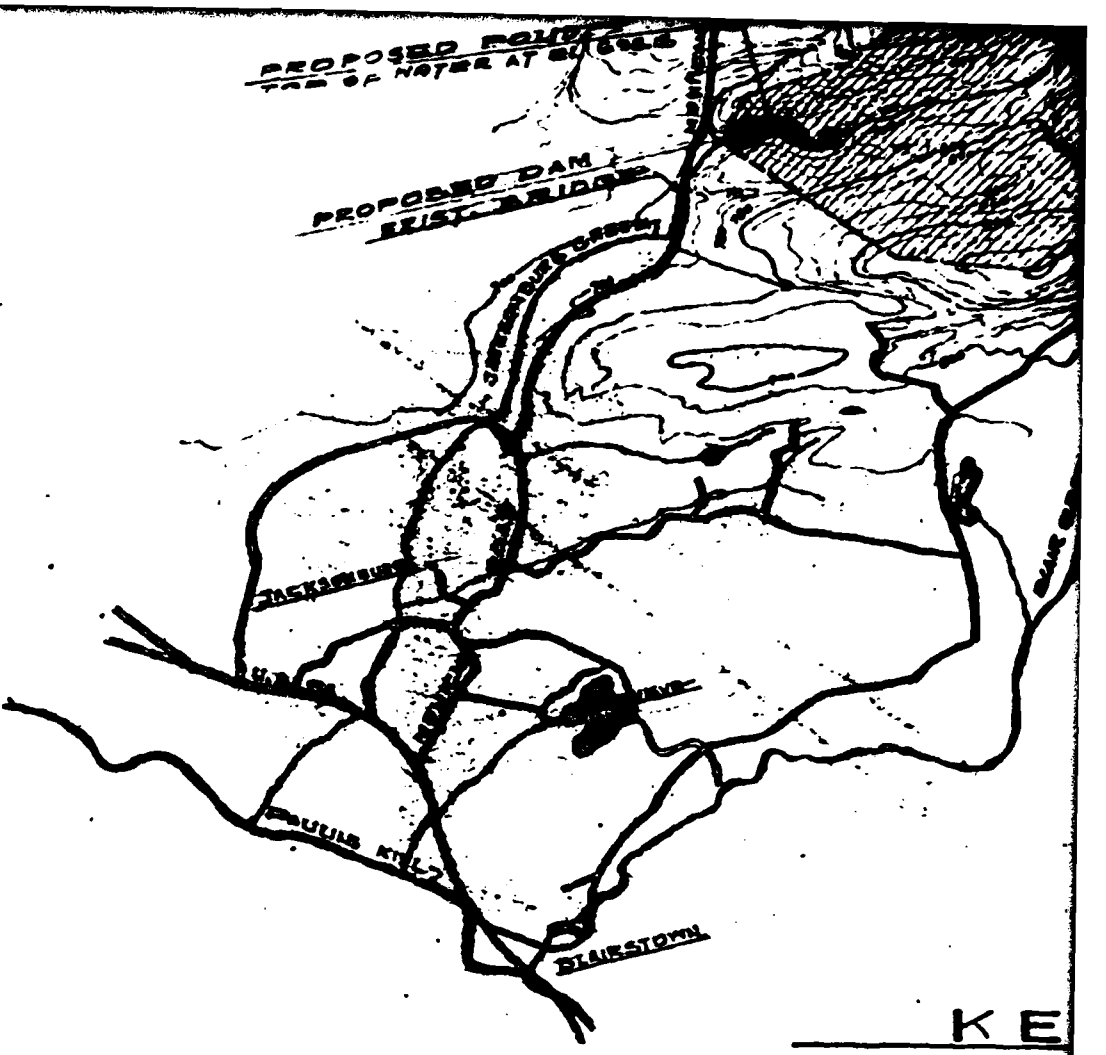
YOUNG

FILE

3

FILE





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SC

APPLICATION FO

KENNET

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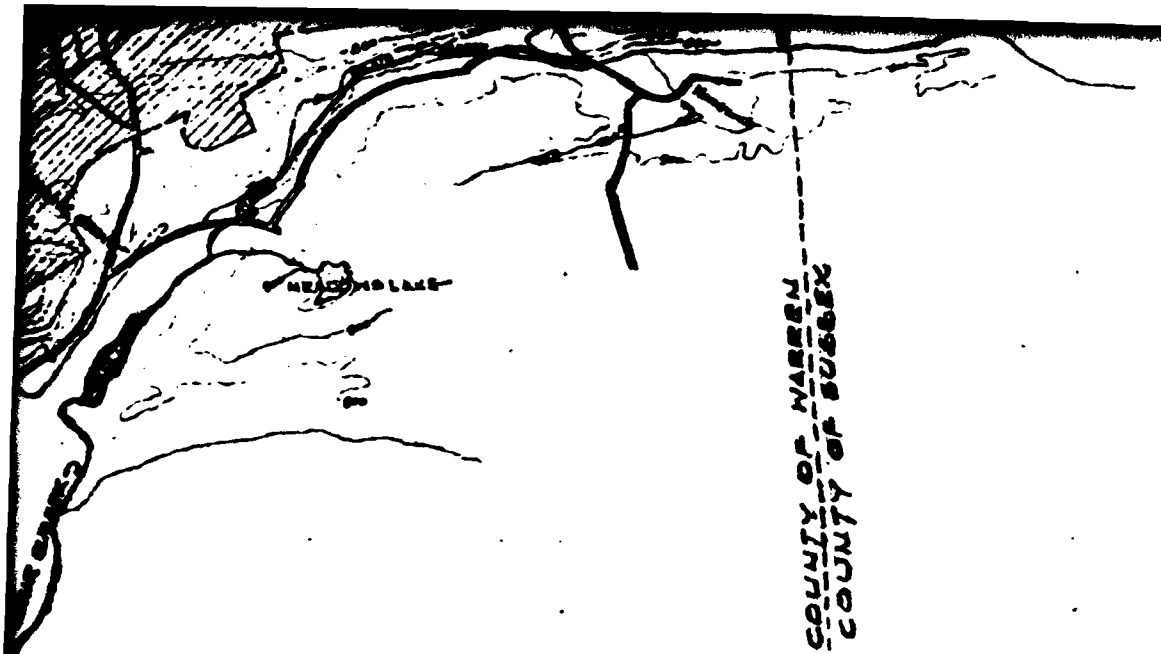

EY MAP

CALE: 1" = 2000 FT.

OR DAM ON JACKSONBURG CREEK

BY

LTH YOUNG

5

6

MORRIS ENGINEERS, Inc.
LEDGEWOOD, N.J.

APPENDIX 5

REFERENCES

YOUNGS POND DAM

APPENDIX 5

REFERENCES

1. Chow, Ven Te, Open Channel Hydraulics, McGraw-Hill Book Company, New York, 1959.

2. King, H.W. and E.F. Brater, Handbook of Hydraulics, McGraw-Hill Book Company, New York, Fifth Edition 1963.

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4. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Flood Hydrograph Package (HEC-1) for Dam Safety Inspection Users Manual, Davis, California, September 1978.

5. United States Department of Interior, Bureau of Reclamation, Design of Small Dams, U.S. Government Printing Office, Washington, 1977, 816 pp.

6. U.S. Department of Interior, Geological Survey, 7.5-Minute Series (topographic) maps, scale 1:24,000, Contour Interval 20 feet: Flatbrookville, N.J.-PA. (1971).

7. U.S. Department of Agriculture, Soil Conservation Service, Urban Hydrology for Small Watersheds, Technical Release No. 55, Washington, 1975, 3.7 pp.

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9. U.S. Army Corps of Engineers, Hydrologic Engineering center, "Flood Hydrograph Package (HEC-1) for Dam Safety Inspections Users Manual", Davis, California, September 1978.

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